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# THE ARCHITECTURAL FORUM

FOR QUARTER CENTURY  
THE BRICKBUILDER



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JULY 1917

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VOLUME XXVII ~ NUMBER 1

DEVOTED TO THE ART AND SCIENCE OF BUILDING  
ROGERS AND MANSON COMPANY PUBLISHERS



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# THE ARCHITECTURAL FORUM

AN ILLUSTRATED ARCHITECTURAL MONTHLY DEVOTED TO THE ART, SCIENCE, AND BUSINESS OF BUILDING

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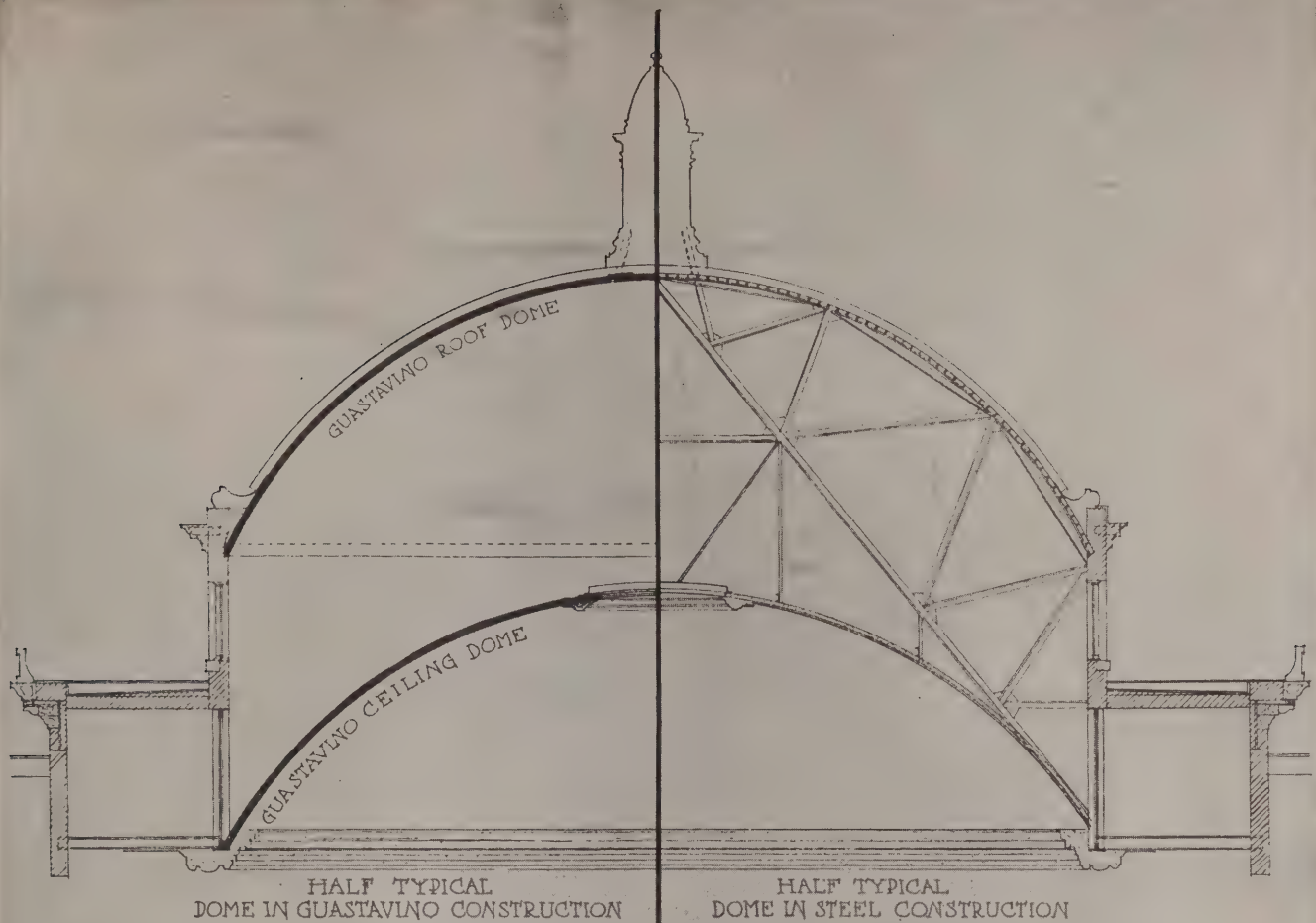
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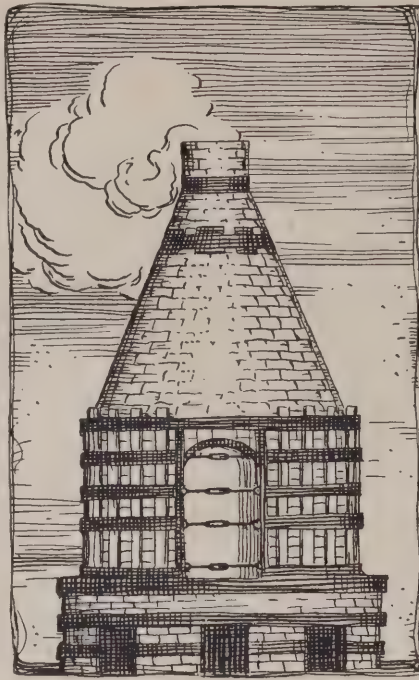
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ESTABLISHED 1888

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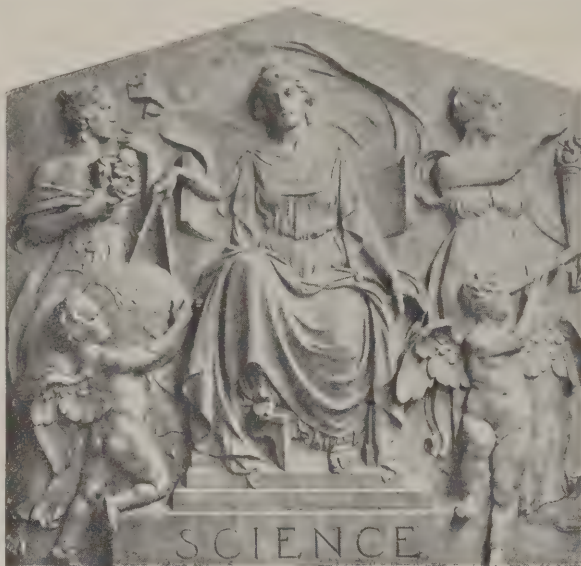
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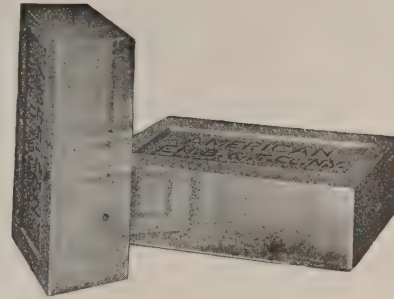
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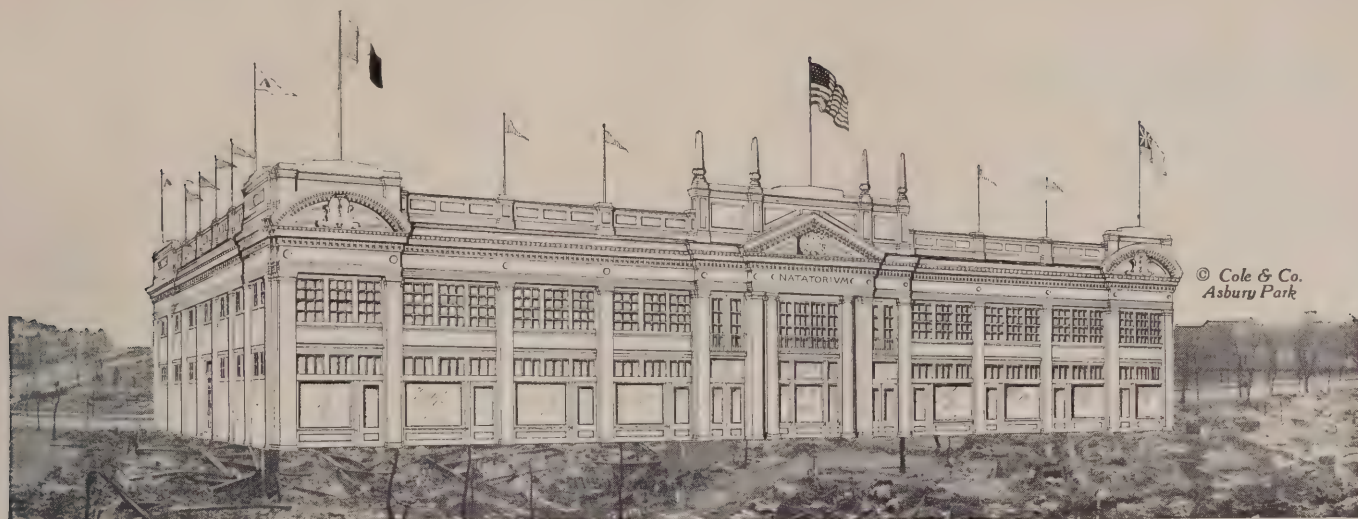
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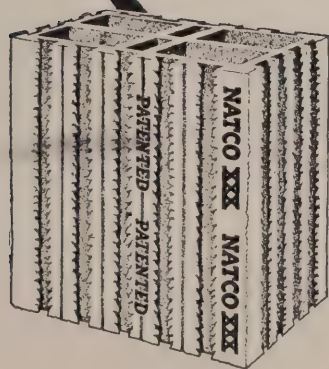
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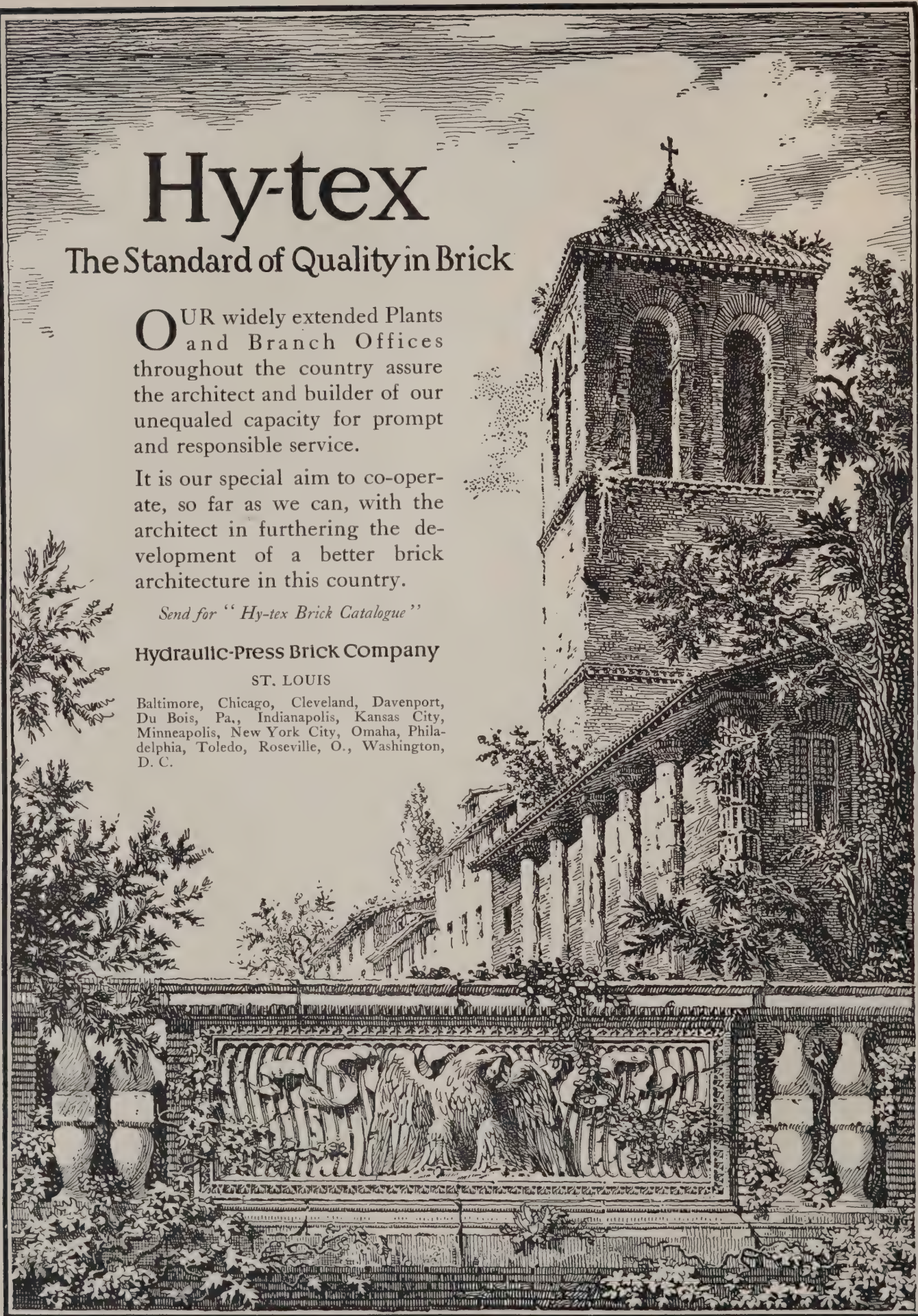
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# THE ARCHITECTURAL FORUM

VOLUME XXVII

NUMBER 1

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# THE ARCHITECTURAL FORUM

## FOR QUARTER CENTURY THE BRICKBUILDER

VOLUME XXVII

JULY 1917

NUMBER 1

### One-Story and Open-Air Schoolhouses in California

By WILLIAM C. HAYS

THE one-story and open-air school building, as recently developed in California, is no novelty. When, nearly two thousand years ago, young Saul of Tarsus journeyed up to Jerusalem to sit with others "at the feet of Gamaliel," it was into an open-air school that he went to hear the distinguished Doctor of the Law. In the temple's outer court Saul met with the free-born youth of his group, out in the open, under a vibrant, clear Oriental sky. When, for a time, the weather conditions became less favorable, it was a simple matter to withdraw into the high portico which surrounded the courtyard, and which offered protection from storm or a too sultry sun. When biting winds swept down from the snow-clad mountains of Lebanon, a lee behind some sheltering wall, with perhaps a brazier of glowing coals, helped to make conditions more endurable. So, still, in the unchanging East, one may see the schools of to-day with their semi-isolated groups of scholars, whose ages vary all the way from ten years to young manhood. Mustered "at their master's feet," their recitation goes on, with sway of body and chanting of voice; learning, as in ancient Jerusalem, the Mosaic Law; in modern Cairo, the Koran.

It was so for the sons of the well-to-do and free-born classes. Less fortunate youths of the East had no such protection but followed their teachers about, to be taught in any chance spaces or recesses along the wayside or, at least, where street commotions were least disconcerting. All the East, throughout all times of history, has had its schooling in the out of doors.

In Greece of classic times, even more strikingly than in the countries lying along the southeastern shores of the Mediterranean, there was a marked similarity to conditions as they exist in present-day California. This resemblance extends farther than to such externals as climate or other natural environment. There were those more significant phases of the school problem which are derived

from a social organization wherein the life of every individual man was, to a degree, a vitally interwoven thread in the fabric of the state. The Greek schools were boys' schools, always and exclusively. During the life period corresponding to our children's grade schools, each boy, attended by his individual *paedagogue*, went for instruction to some *didaskalos*, or schoolmaster. The institutions conducted by these masters had no connection with the state, but were private enterprises of varying degrees of popularity. Their instruction was given for the most part out of doors, although the more substantial and prosperous masters had buildings, furnished and equipped more or less completely, according to the bulky and complicated needs of their day. The buildings themselves seem to have been mostly in the nature of colonnades, lightly constructed, for it is related how in a school at Chios the collapse of its roof caused the deaths of all but one of the hundred and twenty boys in attendance.

Greek youth, like the youth of all other regions having a warm climate, matured early, so, at the age of sixteen, the young Greek's education became a charge of the state, for it was then that he was freed from the attendance of his *paedagogue* and entered the gymnasium. Perhaps, in the course of time, though never within the scanty budgets provided for our schools, either private or public, we moderns may acquire some such equipments as ancient Greece provided for the training of her young men, as exemplified in the Gymnasia—the "Academy," and the "Lyceum" of Athens, for example.

"The gymnasia were spacious edifices, surrounded by gardens and a sacred grove. The first entrance was by a square court, two *stadia* (twelve hundred feet) in circumference, encompassed with porticoes and buildings. On three of its sides were large halls, provided with seats, in which philosophers, rhetoricians, and sophists assembled their disciples. On the fourth were



rooms for bathing and other practices of the gymnasium. The portico facing the south was double to prevent the winter rains, driven by the wind, from penetrating into the interior. From this court one passed into an enclosure, likewise square shaded in the middle by plane trees. A range of colonnades extended round three of the sides. That which fronted the north had a double row of columns, to shelter those who walked there in summer from the sun. The opposite piazza was called *xystos*, in the middle of which, and through its whole length, they contrived a sort of pathway . . . where, sheltered from the weather, and separated from the spectators ranged along its sides, the young scholars exercised themselves in wrestling. Beyond the *xystos* was a stadium for foot-races."

The "Groves of Academe," by the way, furnish us more than one close, human contact between ancient and modern times, for the site itself had been provided by a reclamation project in a method quite like those of our own day. A low-lying malarial district of marshy land, having been bequeathed to the state by Ecadamos, was drained and planted with trees, just as only a few decades ago the modern Italians reclaimed the death-dealing malarial district between Salerno and Pæstum.

It was out doors, in the shaded walks and large free spaces of the Academy, that Aristotle taught, as he had previously done at Stagira.

For purposes of comparison it is enlightening to bring together these antique equipments and our own Pacific Coast schools of similar type. One will

find striking similarities in the conditions which have created the types, as well as between the types themselves. Let us note the marked geological and climatic resemblances between the country along the eastern Mediterranean shore and the California seacoast lands.

California! A blue summer sea; seeming endless mountain ranges follow the coast, sometimes jutting out into headlands, elsewhere turning back

from the shore line to make room for a few sun-sparkling bays; the swift, steep coast water courses cut bank-full to overflowing for a short period of the year, only to sink under the sands and boulders during long, protracted seasons of dry weather. The temperature throughout the year varies but little. In summer there are a few days, perhaps ten of them, of considerable heat, and in winter about

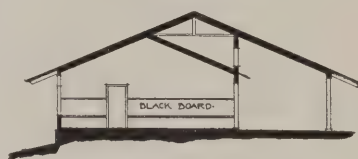
the same number of cold days, when thin ice forms over small bodies of sheltered water. If these few extremes are eliminated, it is doubtful whether the difference in average summer and winter temperatures would exceed ten degrees—almost the climatic condition of Sicily's east coast.

Likewise there is a strong resemblance between the *flora* of the two countries, so marked, indeed, that the Californian traveling the Mediterranean borders, or the Greek or Italian brought to the Pacific Coast, would feel equally at home.

This, of the coast country—leaving the coast behind, however, and going inland, differences of temperature become so marked that in California one may suffer from cold on the Fourth of July and from heat on New Year's



Elevation of End

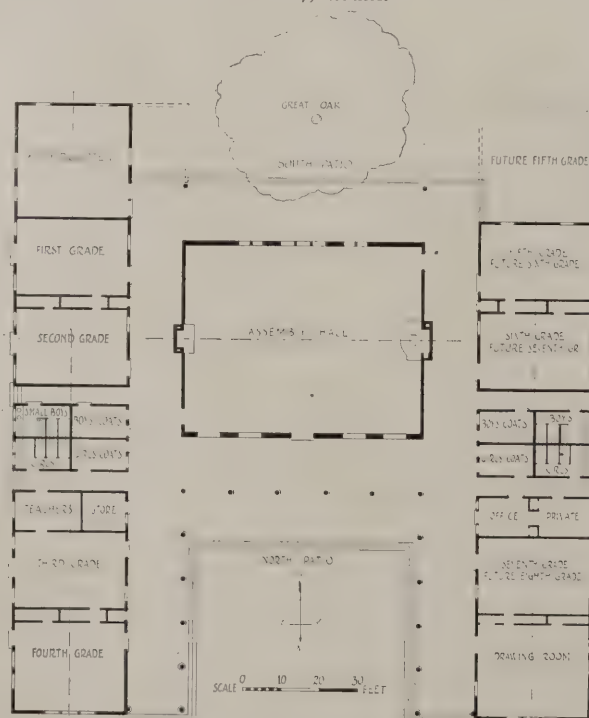


Section through Class Room



Ground Floor Plan of Open-Air Class Rooms

Additions to Polytechnic Elementary School, Pasadena, Cal.  
Elmer Grey, Architect



Ground Floor Plan

Polytechnic Elementary School, Pasadena, Cal.  
Myron Hunt & Elmer Grey, Architects





GENERAL VIEW LOOKING INTO NORTH PATIO  
POLYTECHNIC ELEMENTARY SCHOOL, PASADENA, CAL.  
MYRON HUNT & ELMER GREY, ARCHITECTS







VIEW OF NORTH PATIO



VIEW ALONG OPEN-AIR CORRIDOR

POLYTECHNIC ELEMENTARY SCHOOL, PASADENA, CAL.

MYRON HUNT &amp; ELMER GREY, ARCHITECTS





Day, for conditions vary all the way from the tropical Imperial Valley to the glacial higher Sierras.

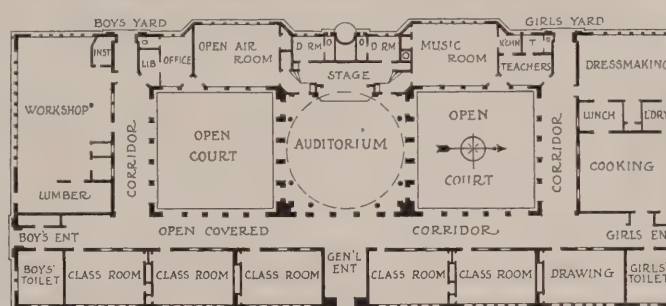
Conditions vary, too, even in the same region; as, for example, around San Francisco Bay, where ten or twelve miles of local travel will take one into entirely dissimilar exposures and climate. In one district one finds chill, fog-laden winds sweeping in sometimes day after day straight from the sea; in another, under the shelter of the forested coast-range hills and far enough south (or north) to be clear of the Golden Gate fog zone, it is balmy and often almost too warm.

What, then, is the type of school building indicated by natural conditions in the coast country of California? The one-story, open-air type which logically came into being ages ago in ancient Greece.

It will be interesting to analyze some recent expressions of this type. In its simplest form, the unit which goes to make up the one-story school building is the school-room lighted on one long side and paralleled by a corridor on the other. Such a room has no distinguishing quality, and no special virtue, but is in all respects like the basic unit of the "stuffy," multi-storied type of



Corridor, Garfield Intermediate School, Berkeley, Cal.



Ground Floor Plan

Garfield Intermediate School, Berkeley, Cal.



Street Elevation, Garfield Intermediate School, Berkeley, Cal.

Coxhead & Coxhead, Architects





Patio, Grammar School for Crystal School District, Suisun, Cal.

building all too common everywhere. When, as has sometimes been done, two such rooms are built side by side, with a closed corridor between them, at least one (and that, perhaps, the most important) object of the one-story type of schoolhouse, namely, airiness, is to all intents and purposes defeated, even though the windows may open largely toward courts or gardens. This arrangement loses sight, completely, of the fundamental desire to improve hygienic conditions in the class room. There is no possibility of good "natural" cross ventilation, and the weight of testimony from experienced teachers (at least in California) is all on the side of natural ventilation as against any artificial system, even the most perfectly designed. It is, of course, necessary that adequate provision should be made for artificial heating when needed, and especially to keep the floors dry and warm. This is an "open" country—open doored, open windowed, open minded. But the "open minded" among teachers, as well as among the more interested of the parents,

seem to be of one opinion,—that artificial ventilation will not do here.

Accepting this point of view, then, one naturally looks to cross ventilation of some sort, and this means not merely the providing of small, theoretical vents and louvres in the wall opposite the windows, but of large openings on the entrance side of the room, the doors ordinarily being left open. Thus there enters a new factor, for under certain conditions there is danger of too nearly equal-

ized bi-lateral lighting. However, it is found, that when the open corridors are broad enough, the little light entering the class rooms from them is so diffused that it serves a highly useful purpose and softens the shadows cast by the usual "left shoulder" illumination. Another, and far from negligible function of these broad corridor openings will be brought out in discussing the psychology of the one-story, open air schoolroom in a paper to follow.

It is this type of unit, then, that is accepted as



Exterior, Grammar School for Crystal School District, Suisun, Cal.



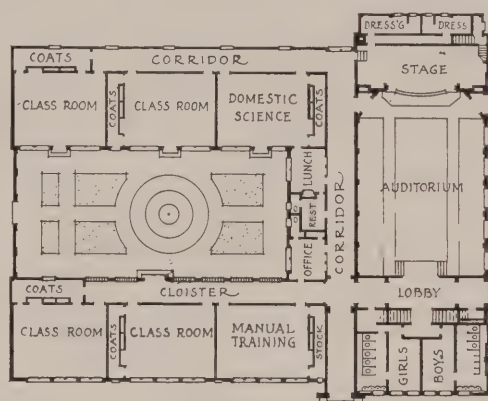
the basic feature for repetitions, many or few, in the composition of the school plan. It is the type, no matter what modifications may be dictated by local conditions, mainly climatic, such as exposures to sweeping winds and rains, or local averages in temperature.

When ranges of these units are planned to form and enclose two or three sides of a court, the court becomes a playground. These typical "room-and-corridor" units are arranged usually in long, parallel series, the corridors generally facing inward, although sometimes conditions of climate, exposures to unpleasant prevailing winds, or other causes indicate a better arrangement; as, for example, where the wings are exact repetitions, but without reversing room and corridor to the right and left of a central axis. Sometimes irregularities of site, steep grades or property boundaries which are other than at right angles may dictate corresponding irregularities in plan. Not infrequently, too, there may result unsymmetrical arrangements when natural growths of trees are to be

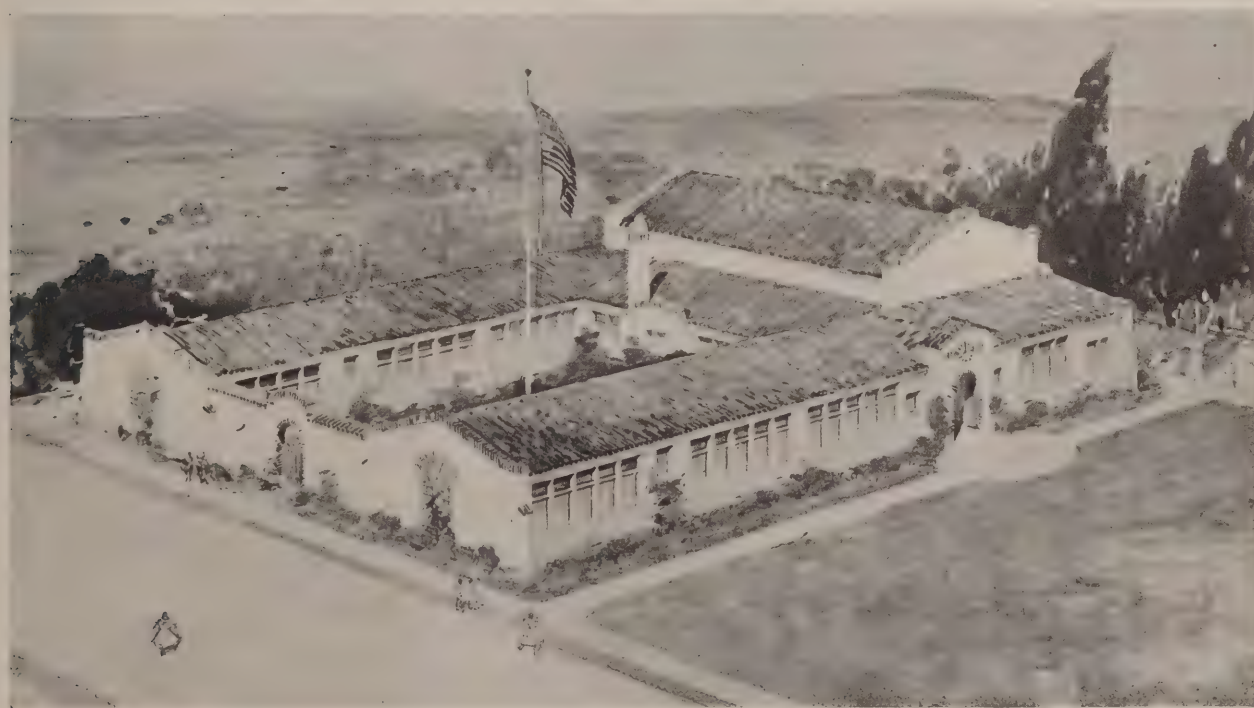
reserved. Some of these irregular arrangements are most charming and picturesque, and they gain much from the informality which will, for example, leave the broad-spreading shadow under a gnarled live oak, to give shelter from the sun in the midst of the school's open court yard.

Probably the earliest, and still, without doubt, among the best of all the buildings of this type which have come under my notice, is that of the Polytechnic (formerly "Throop") Elementary School at Pasadena, of which Myron Hunt and Elmer Grey were the original architects, and Mr. Grey the architect of the subsequent additions. As it is the best, so it is the simplest and least

pretentious — least removed from the home environment to which the average child is accustomed. Coming here to school, the child has no need of mental or spiritual readjustment; his day's activities continue as usual, but merely in a changed location. During his hours at home his life goes on mostly in the garden, under trees, porch, or pergola; it is so, too, while he is attending school. Looking out



Ground Floor Plan  
Position of the corridors in wings is due to the direction of prevailing winds



Bird's-eye Perspective View

Grammar School for Crystal School District, Suisun, Cal.

Edwin J. Symmes and Wm. H. Crim, Jr., Associate Architects





Terrace of McChesney Elementary School, Oakland, Cal.

John J. Donovan, Architect

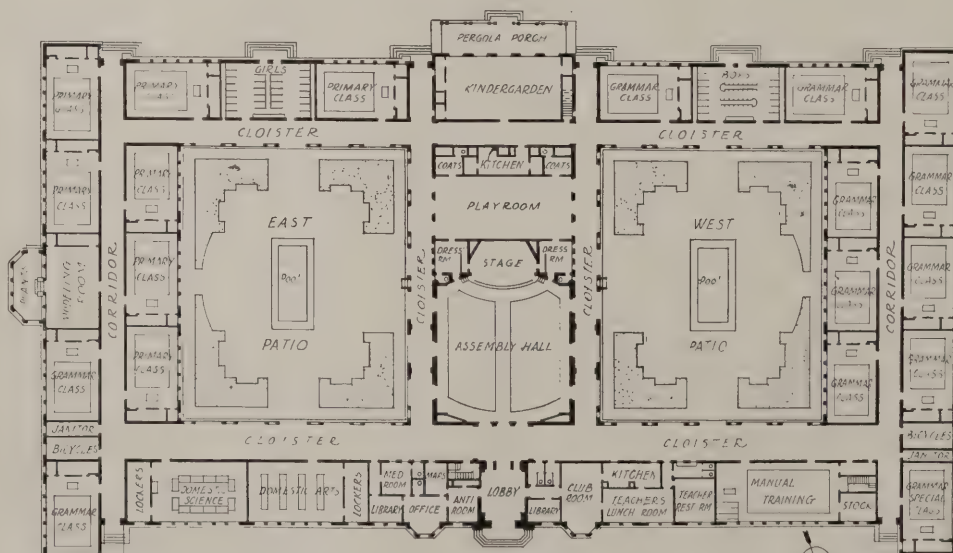
*This terrace would be greatly improved by being brought into closer association with nature, as in the case of the Pasadena Polytechnic School*

through the light, scrim curtained windows of the class rooms into which he comes, one may see "a stretch of green grass, with here and there a tree, and one or two twisted vines craning their necks to find out what goes on inside." To be sure, other children are congregated with him there, but they are only his many friends; his broadened family circle. A teacher guides his studies and joins in his play — so would his mother or older sister, were he yet at home. His allotted times with given studies are not long and although he uses books, he proves that the school which provides occupations need seldom set tasks. He studies within wide-open doors and beside great, cool, shaded passageways. He is accustomed to visitors, who may quite naturally stop a moment to glance into the room. Nor are these visitors always grown-up "humans." While I was looking about the school an inquisitive robin hopped across the cement floored passage from the garden, passed over the

broad threshold into a class room, and cocking his head to one side, then to the other, "sized up" the situation, turned, and went back outdoors. It was significant that the bird's coming was taken as a matter of course: no child stopped his occupation, and only one or two nearest the door seemed conscious of the visit. A teacher told me that even when stray dogs unexpectedly made free with the open doorway, there was no more distraction, and I was reminded by contrast of one far-off time when a fox terrier at large visited the chapel service in my own college days.

Is there some special virtue in the unpretentious type of this building at Pasadena? I think so. At the University of California we now gather our architectural classes in

quarters of most plainly temporary construction. From the beginning the place has borne an intimate name — "The Ark." (There was, indeed, a striking resemblance between our original small building and the Noah's Ark of a by-gone childhood.) Some day, with the development of the University's permanent buildings, we shall be housed in splendid fireproof quarters — perhaps within cut granite walls. Will a spiritual something, evasive and precious, lose its way on the moving day? Personally, I have my fears!



Ground Floor Plan

Emerson School, Oakland, Cal.

John J. Donovan and John Galen Howard, Associate Architects





VIEW IN PATIO LOOKING TOWARD ASSEMBLY HALL



GENERAL VIEW LOOKING ALONG STREET

EMERSON SCHOOL, OAKLAND, CAL.

JOHN J. DONOVAN AND JOHN GALEN HOWARD, ASSOCIATE ARCHITECTS

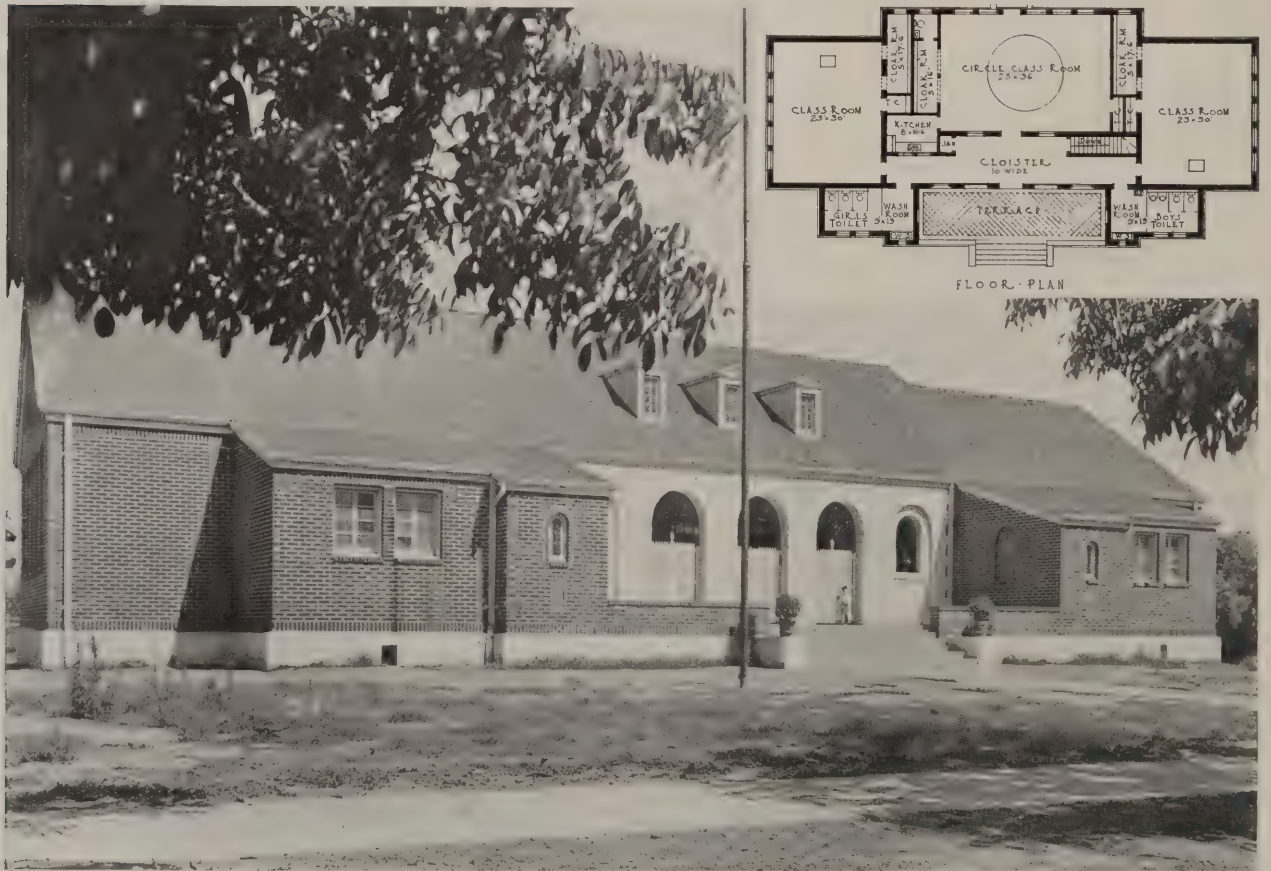






GRAMMAR SCHOOL, AZUZA, CAL. ALLISON &amp; ALLISON, ARCHITECTS

*In proportion and simple handling of inexpensive materials this school is comparable with the Pasadena Polytechnic School*



MARENGO PRIMARY SCHOOL, ALHAMBRA, CAL.  
ALLISON & ALLISON, ARCHITECTS



# The Motion Picture Theater

## II. PLANNING FOR SIGHT AND PROJECTION LINES

By CHARLES A. WHITTEMORE

NOTWITHSTANDING the fact that much has been written on the subject of theater construction, and that plans and sections of many theaters have been published in the architectural press, there is a lamentable lack of knowledge on the part of many in the architectural profession as to the requirements of a theater whether it be of the legitimate type, a vaudeville house, or motion picture theater. The principal stumbling block aside from purely technical questions, such as electrical layout, stage equipment, etc., seems to be in regard to sight lines and, while there is no special trick or concealed knowledge about this particular factor in theater construction, many architects seem to approach the layout of a theater with a great deal of hesitancy on account of the terrors which the sight line problem holds for them.

It may be well to analyze the steps necessary to determine the various divisions of a house before giving in detail the elements involved in a solution of the sight line problem.

After the lot has been selected the number of seats required is settled. This at once determines whether the plan shall include a balcony, or balcony and gallery, or be a single division type of house. The sight lines of this latter type are so simple that for the sake of the complexity of the problem the multiple division type will be discussed, which naturally will include the other.

The arrangement of lobbies, stairs, and elements beyond the limits of the auditorium need not here be considered, although because of the fundamental building law requirements these factors limit the seating capacity. Before the layout of the balcony and gallery can be definitely determined, the lobbies and stairs must be at least tentatively located, as these elements control the rear balcony and gallery wall line, if the lobbies immediately precede and are at the same level as the rear rows of seats. Where the mezzanine lobbies and "vomitories" are adopted, these considerations do not exist with the same force, although they are still factors in the final determination of the seating capacity.

Having located these components the next consideration is how low to keep the balconies; what "head room" over the rear row of seats on the floor; what "clearance" under the front portion of the balcony soffit is necessary. In the deter-

mination of these points the structural members need careful consideration. Assuming that all the features have been provisionally established, the sight line layout is to be next worked out.

The width of the steppings in balcony and gallery should never be less than 2 feet 6 inches and better 2 feet 8 inches if space will allow. The platform for the front row of seats should be at least 3 feet wide and the same space should be allowed for the rear row. These distances are particularly important in balcony and gallery as the steppings are not easily changed when once constructed. The same dimensions should apply to the seat spacing in the orchestra floor, but as this floor is usually unbroken, the layout need be exact only to determine the location of the stand up rail.

The distance from the front of the balcony or gallery rail is also important as too great an "overhang" prevents the possibility of a free, open appearing auditorium, and the patrons in the rear under these "overhangs" feel as though they were in a tunnel. It is not possible to determine the distance for every theater on the same basis, but if the depth of the balcony equals the distance from the front to the curtain line, a good effect may be obtained.

When these essentials have been all tentatively located it is necessary next to determine the minimum amount of stage, scenery, settings, auditorium, etc., necessary to be seen from the least desirable seats; how much of the width of the back wall of the stage the auditorium as a whole should be enabled to have in the range of vision; how much of the height of the proscenium should be seen from the back of the auditorium on the orchestra floor and in the balcony; how much of the stage and orchestra should be visible from the gallery.

Having determined these points it is simple enough to draw lines indicating these rays of vision on the section and to arrange the constructional members of the various parts of the house so as to permit an unobstructed view within the limits of these predetermined lines. For example, if in Fig. 1 a point be taken on a line 4 feet below the level of the stage and 2 feet in advance of the curtain line, on the main axis of the auditorium, and from this point a line be drawn to the top step at the back of the balcony, and if another line be taken from a point, say, 18 feet up on the



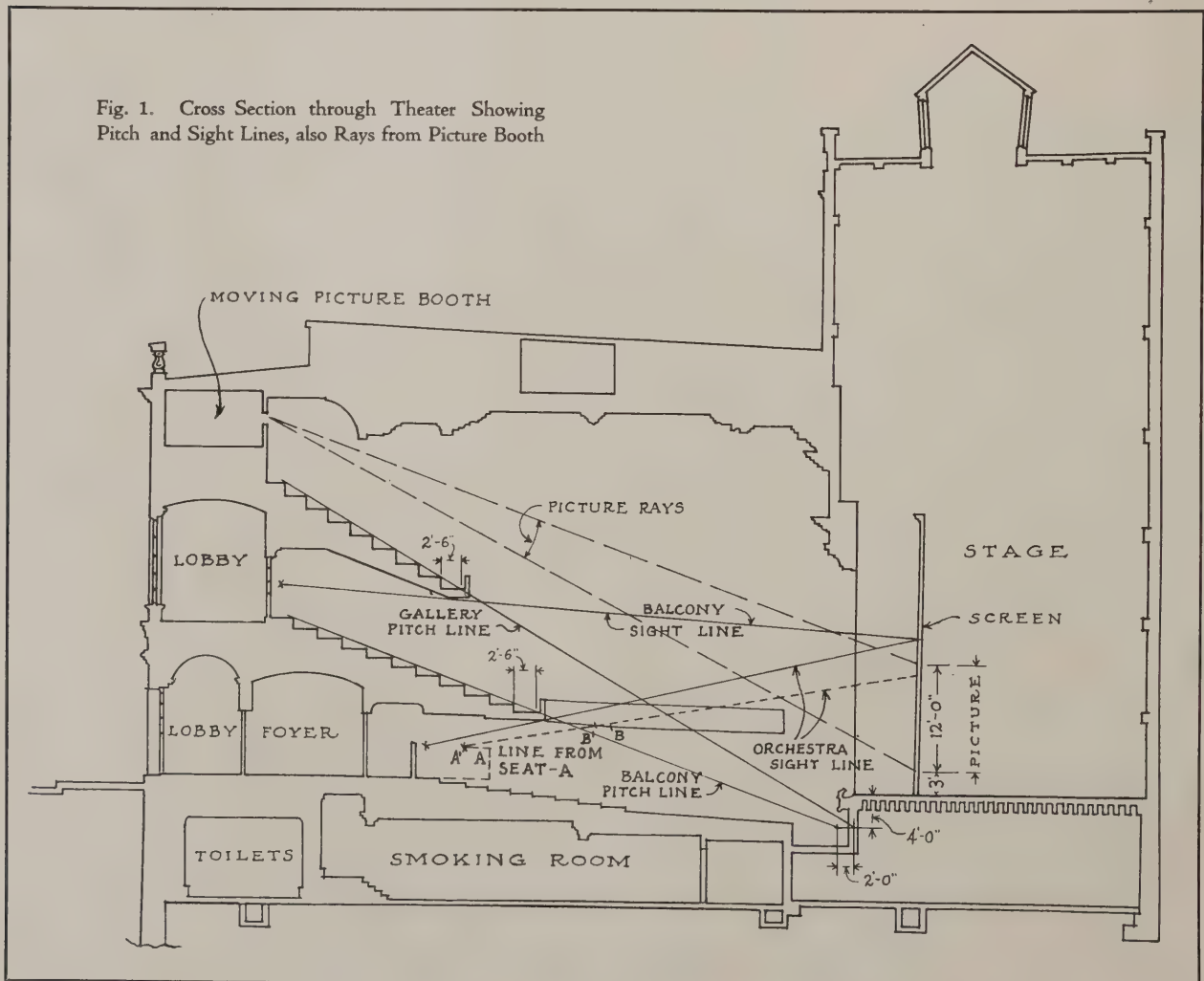
curtain line and carried to a point 4 feet above the floor level at the back row of seats in the orchestra floor, the intersection of these lines immediately locates a point at the front of the balcony, and the angle of the line from the point below the stage floor previously referred to will determine the exact pitch of the rows of seats of the balcony. The line indicating the pitch of the seats, it will be noted, passes through a point 2 feet 6 inches in front of the first riser in the balcony, rather than through the exact front of the balcony level itself, and in case a broad aisle is used as an intermediate, the steppings to the rear of the broad aisle will be higher than those of the front, thus preserving the same general sight lines.

In a similar manner, if a line be taken from a point 4 feet above the back row of seats of the balcony to a point, say, 18 feet above the stage on the side of the proscenium arch, this line together with the sight line from the point below the stage to the top step at the back of the gallery will determine the front of the gallery; and the pitch of

the seats in the gallery can be determined in the same manner as for the balcony.

The sight lines above referred to inscribe various spaces which are assumed to be in a plane with the main axis line of the auditorium. The same principle may be followed in determining the sight lines from any seat in the house, always revolving the plane of the sight line into the plane of the axis, in order to facilitate the projection on the main section.

The arrangement of lines as described will constitute a sight line arrangement which is as nearly ideal as the practical side of the problem will permit, and in case of extreme congestion in space or if it is desired for any special purpose to get a greater seating capacity than this layout would permit, the sight line points may be taken on the curtain line 4 feet below the stage, rather than on a point 2 feet in advance of the curtain line. It must be borne in mind, however, that as this sight line point is moved toward the back of the stage, each interval toward the rear decreases the visible





spaces on the orchestra floor from the balcony and gallery.

This, however, is not the whole of the sight line problem. As the seats are laid out on concentric curves the sight line at the extreme right or extreme left of the auditorium naturally flattens so that the front of the balcony or gallery cuts off more or less of the sight area from the seats in the back of the gallery or the seats at the back and side of the balcony. The method of determining the limiting points under these conditions is exactly the same as was followed in establishing the sight lines along the axis of the auditorium in that it is a simple matter of projection. Where the sight line from the back row of seats in the balcony cuts the rail of the boxes, if there be such, or cuts the rail of the balcony front, the intersection should be projected to the axis line of the auditorium, and the intersection of the sight line with the point 2 feet in front of the curtain line and 4 feet below the stage should also be projected to the axis line of the auditorium. In other words, the extreme seats are revolved about a point at the edge of the proscenium opening into a plane parallel with the axis of the auditorium. This gives the proper plane in which to lay out the sight lines for the extreme seats.

In the same way the rotation of the extreme seats on the orchestra floor into a plane parallel with the axis line of the auditorium as illustrated in Fig. 2 will show immediately how much of the predetermined sight space is cut out by the camber or curve of the balcony soffit, and makes possible an adjustment of the balcony soffit to increase or decrease the range of the sight line from the extreme seats.

While a description of the method of working out sight lines may sound more or less complicated, their actual working out can be practically accomplished in a very few minutes, and any one once having the sight line principle established in mind need have no fear of any problem which may arise involving its use.

The sight line layout as above explained and as illustrated in Fig. 1 applies only to the type of theater having a balcony and gallery, and the problem involved in the single division type as

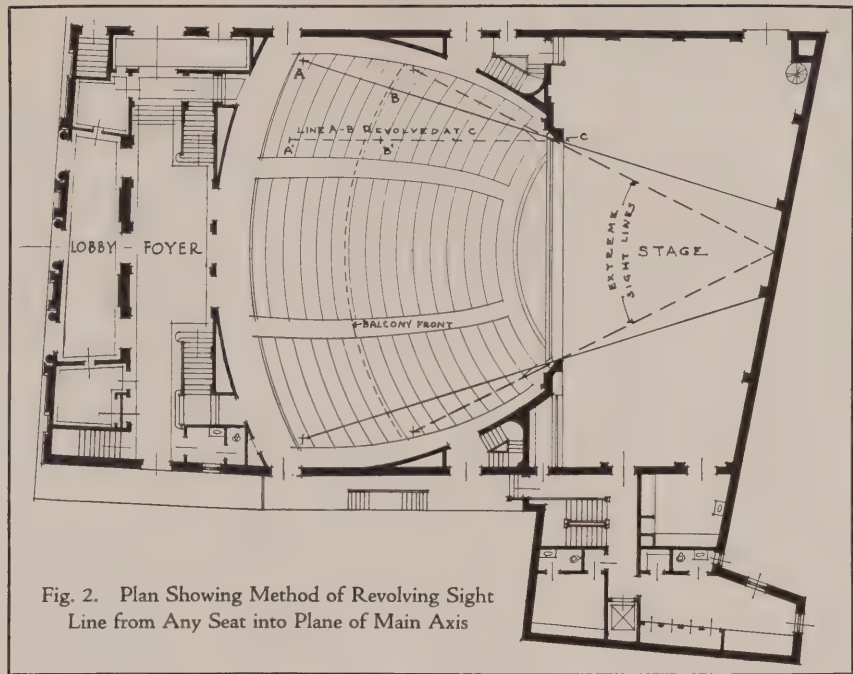


Fig. 2. Plan Showing Method of Revolving Sight Line from Any Seat into Plane of Main Axis

illustrated in the preceding article is confined exclusively to the sight lines for the people on the floor. Under such conditions it becomes almost identical with the problem for solving the curve of the orchestra floor of any type of theater, and it might be well to recall to mind the method adopted in laying out this factor.

The distance in elevation between the stage and the floor in front of the first row of seats is usually 3 feet. From this low point in the orchestra floor the level should be carried back approximately three rows. This distance, however, must be carefully considered in relation to the distance of the picture screen above the stage floor, the distance back from the curtain line, and whether or not there is an orchestra on the stage or in the pit. In each case, however, the sight lines back of the first three rows of seats would be solved in the same general way, and in case a picture screen is set back approximately 14 feet from the curtain line (which is the back face of the proscenium arch), and is elevated at least 3 feet above the floor, the conditions are such that the people in the second row can readily see the entire picture over the heads of the people in the first row even though the seats are on the same level.

Back of the first three rows of seats the floor continues in a rising curve which very closely approximates the curve of a parabola, the limiting rise of which is 1 foot in five. This limit is established by law and is maintained for all gradients leading toward an exit. In other words, no aisle or passageway leading toward an exit from the

theater should be built on an incline having a greater rise than 1 foot in 5 feet.

In laying out this curve, if the floor is to be laid on a true curve, the front point and the rear point having been established, it is customary to approximate the curve and then try out the sight lines rather than to attempt to accurately establish the curve by any formula.

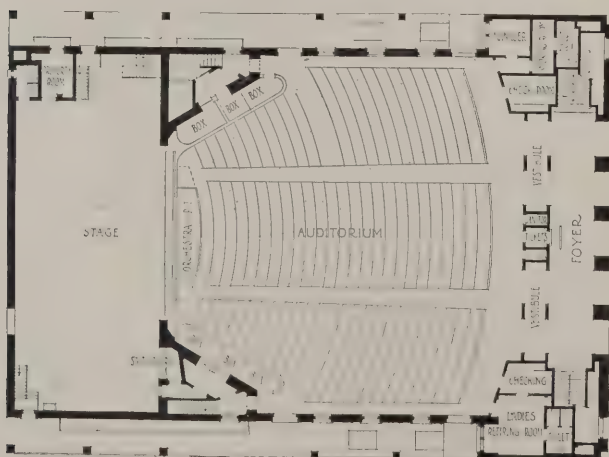
Many theaters have no curve whatever to the orchestra floor, the rise being accomplished by sections of flat floor construction at different pitches, each section being tangent to what would be the true curve in its respective portion of the orchestra floor.

Within a very few years the attempt was made to lay out a theater with what was called a dished floor, but this construction has now been obsolete for some time. The dished floor construction is that in which the seats are all arranged on concentric circles, but each circle instead of being level rises from the center to the outer edge. It is almost incomprehensible that any one should attempt in any practical work to lay out a floor of this character as it immediately makes the sight line problem of the extreme side seats far more difficult than before, and is the exact reverse of the correct and accepted layout for the seats in the balconies and galleries in which divisions of the house the outside or extreme seats are as a rule lower than the seats in the center.

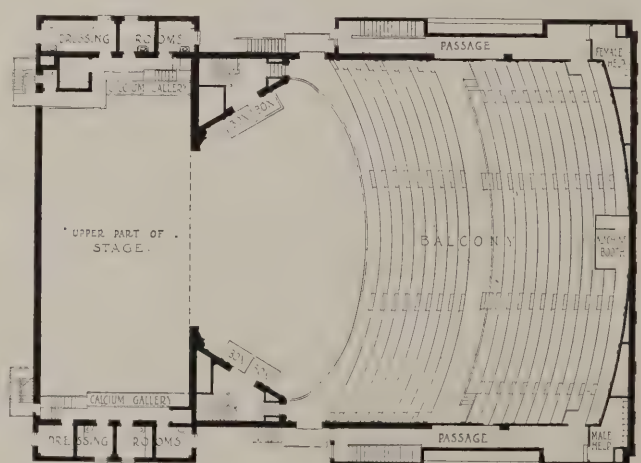
The orchestra floor should be constructed when seats are arranged on the concentric curve plan, so that each row of seats is exactly level all the way across the house. In the balcony and in the gallery, as has been mentioned above, this does not hold true, and the camber or drop of the seats from the center to the side is one of the problems which must be carefully worked out.

The reason for this is sufficiently simple, but the idea may not occur without a little explanation. Assume, for a moment, a person sitting in the rear row of seats at the extreme side next to the outside wall. Such a person in looking across toward the center of the stage or toward the extreme opposite side of the stage would have a vision line of a certain length and pitch, while in looking at the nearer side of the proscenium arch the difference in elevation between the observer's eye and the stage level is exactly the same as in the previous condition, but the pitch of the sight line is considerably greater. Consequently, in order to give the people on the side of the balcony or gallery a clear unobstructed view of the full opening of the proscenium arch at or below the stage floor level, it is necessary that all those seats immediately in front of him should be dropped at a little sharper angle than the drop of the seats on the main axis of the house. When this point has once been fully established in mind and has been carefully worked out, no further troubles need be anticipated except in extraordinary construction; but it is a fact that the sum of all the difficulties of sight line work in theater construction rests in this point and in the determination of the sight line for the extreme side seat in the rear of the orchestra floor. The rear row of seats in balcony or gallery is usually made level, and on the extreme side aisles the intervals or steppings between the front and rear rows of seats are equally spaced. This makes a gradually increasing height to the steppings as they progress from the center to the side. The legal limit to the height of these steppings is 21 inches, and where this extreme height is used two intermediate steps in the aisles must be provided.

With the advent of motion pictures a new problem in sight lines was immediately presented, the



Auditorium Floor Plan



Balcony Floor Plan

Schenley Theater, Pittsburgh, Pa.





GENERAL VIEW OF FACADE



VIEW OF INTERIOR FROM THE STAGE

SCHENLEY THEATER, PITTSBURGH, PA.

H. E. KENNEDY CO., ARCHITECTS

light rays of the picture machines being a new factor. The arrangement of the picture booth so that these light rays will not interfere with the sight lines of the theater, and so that interference with the light rays on the part of the audience would be impossible, has made the problem a little more complex.

It is necessary, therefore, before finally establishing the location of the picture booth to project rays from the contemplated locations of the various machines and check up with the seating layout so as to ensure freedom from obstruction. Nothing is more annoying to the audience watching the picture than to see the top of some one's head moving in shadow across the screen or to see some mischievous member of the audience raising a hand to project a shadow on the screen, and it is obvious that if the picture booth be located in back of the last row of seats, the possibility of such obstructions must be carefully considered.

In Fig. 1 the rays have been shown projected from the picture booth in such a manner as to establish the condition where interference is impossible.

It will be well to give a few general rules as to the location of the apertures through which these light rays are to pass, but before discussing this feature it will also be well to consider the layout of the machinery in the booth.

This layout as used in the better class of houses includes three machines — two for picture projection and one for stereopticon, or "stills." The machines are so linked together that the shutters of each may be operated from one lever so that in running a multiple reel feature the transition from one machine to another may be made instantaneously and with practically no break in the continuity of the picture. The only adjustment required is the natural focus of two machines on the same picture screen. Each of the picture machines except the stereopticon has a single aperture through the wall for the light rays and an additional observation hole for the operator to use in watching the picture. The stereopticon, however, has two apertures, one for each lens, and these apertures are located at a different level from those of the picture machine.

The picture machine opening is usually 3 feet 6 inches from the floor to the center of the opening. The lower stereopticon opening is usually 3 feet from the floor, while the upper opening is 4 feet to 4 feet 6 inches above the floor.

In laying out the ray lines (Fig. 1) from the machine booth a line is drawn from the center of the projecting aperture to the top of the screen

and another line from the center of aperture to the bottom of screen. This establishes the zone of light as the spread of rays is supposed to be controlled by the lens so as to just encompass the size of the picture screen.

The lower line corresponding to the lower ray of light is the one from which the interference on the part of the audience might be expected, and this point should be not less than 7 feet above the back row of seats and approximately 7 feet above the front row.

It is necessary, however, to consider that space saving in the cubical contents of the building requires the ceiling to be maintained at as low a level as possible, but not to the extent of causing obstruction with the upper ray of light on the part of cornice members, beams, etc. For this reason the apertures in the booth should be carefully located and the ray lines drawn to the screen before the ceiling construction is definitely established. Care should also be taken that cornices, etc., do not reach to such a point as to cause an uncomfortable reflection from the ray of light that might annoy the audience.

The essential features in sight line layout have here been considered and while there are numerous other problems involved in the proper layout of the theater to ensure high range of visibility for all of the patrons, the same considerations apply to the different seats in the house as have here been noted.

The whole problem is a simple matter of projection after the fundamentals have been understood.

Reference to Fig. 1 and Fig. 2, in which the sight line from seat A has been worked out through the intersection of the point B to the screen, gives the essential method of working out every seat likely to have an obstruction in its range of vision, and by taking various sight lines from the same seat at different intervals along the curtain line the exact outline of the obstruction can be plotted.

Where boxes are used in connection with the theater layout, it is quite essential that the sight lines through various points on the soffit of the boxes should be worked out, as frequently by a slight elevation or a slight decrease in projection the obstruction may be entirely cleared from the picture.

The whole problem, then, is one of projection and trial and adjustment, and after it has once been successfully solved, there will be no further terrors for any one who has formally approached it with some trepidation.





DETAIL OF MAIN ENTRANCE

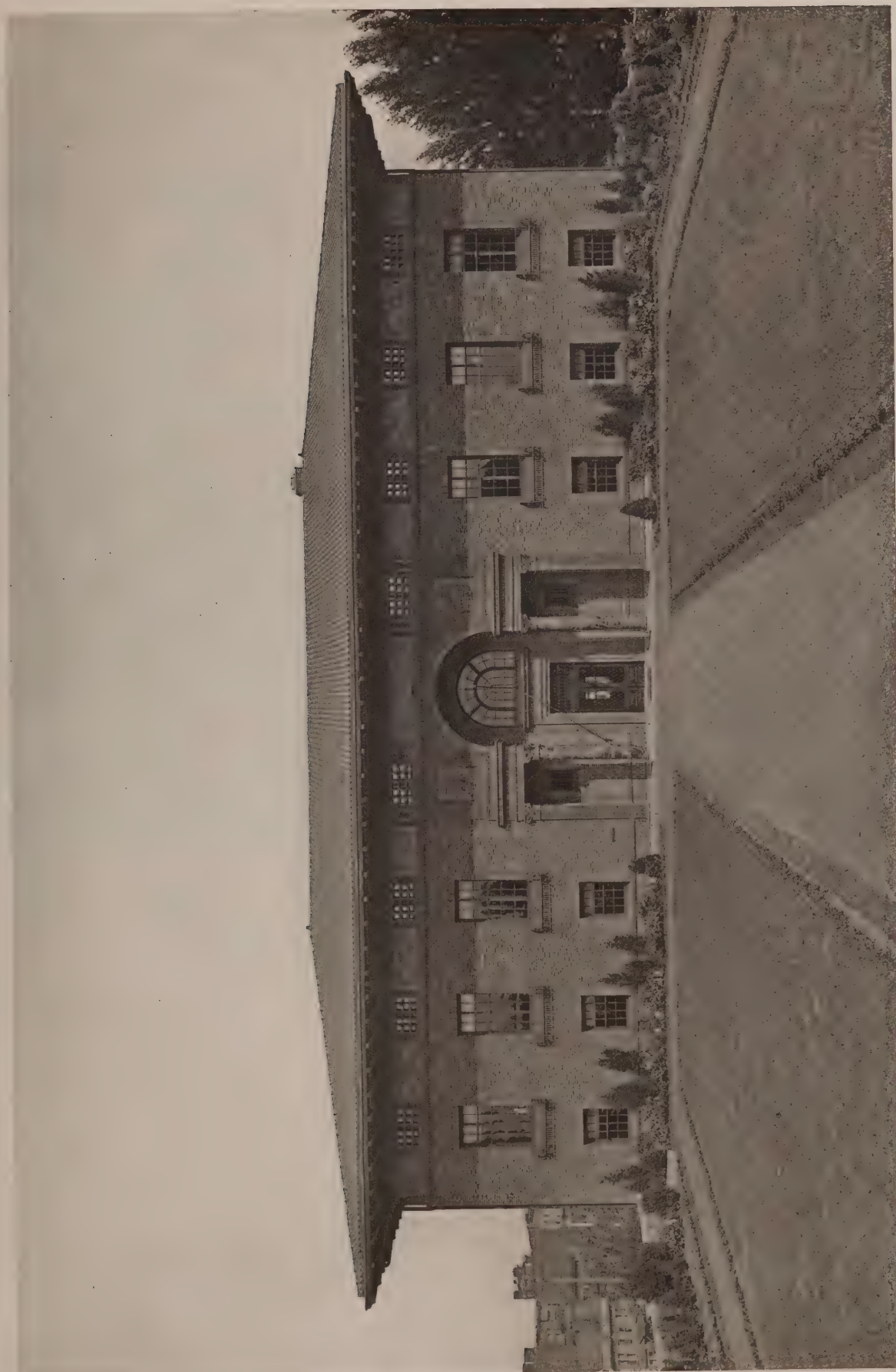
ADMINISTRATION BUILDING, ESSEX COUNTY PARK COMMISSION, NEWARK, N. J.

H. VAN BUREN MAGONIGLE, ARCHITECT

*This rule shows the extreme size of the plate illustrations in former editions of The Architectural Forum*







ADMINISTRATION BUILDING, ESSEX COUNTY PARK COMMISSION, NEWARK, N. J.

H. VAN BUREN MAGONIGLE, ARCHITECT









DETAIL OF PRINCIPAL ELEVATION FROM LOWER LEVEL

ADMINISTRATION BUILDING, ESSEX COUNTY PARK COMMISSION, NEWARK, N. J.

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DETAIL OF LOWER PART OF MAIN ENTRANCE

ADMINISTRATION BUILDING, ESSEX COUNTY PARK COMMISSION, NEWARK, N. J.

H. VAN BUREN MAGONIGLE, ARCHITECT







DETAIL OF UPPER PART OF MAIN ENTRANCE  
ADMINISTRATION BUILDING, ESSEX COUNTY PARK COMMISSION, NEWARK, N. J.  
H. VAN BUREN MAGONIGLE, ARCHITECT

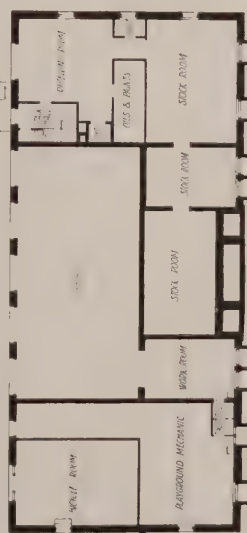
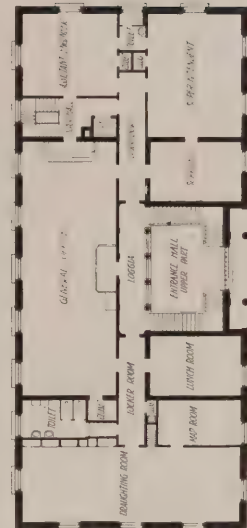
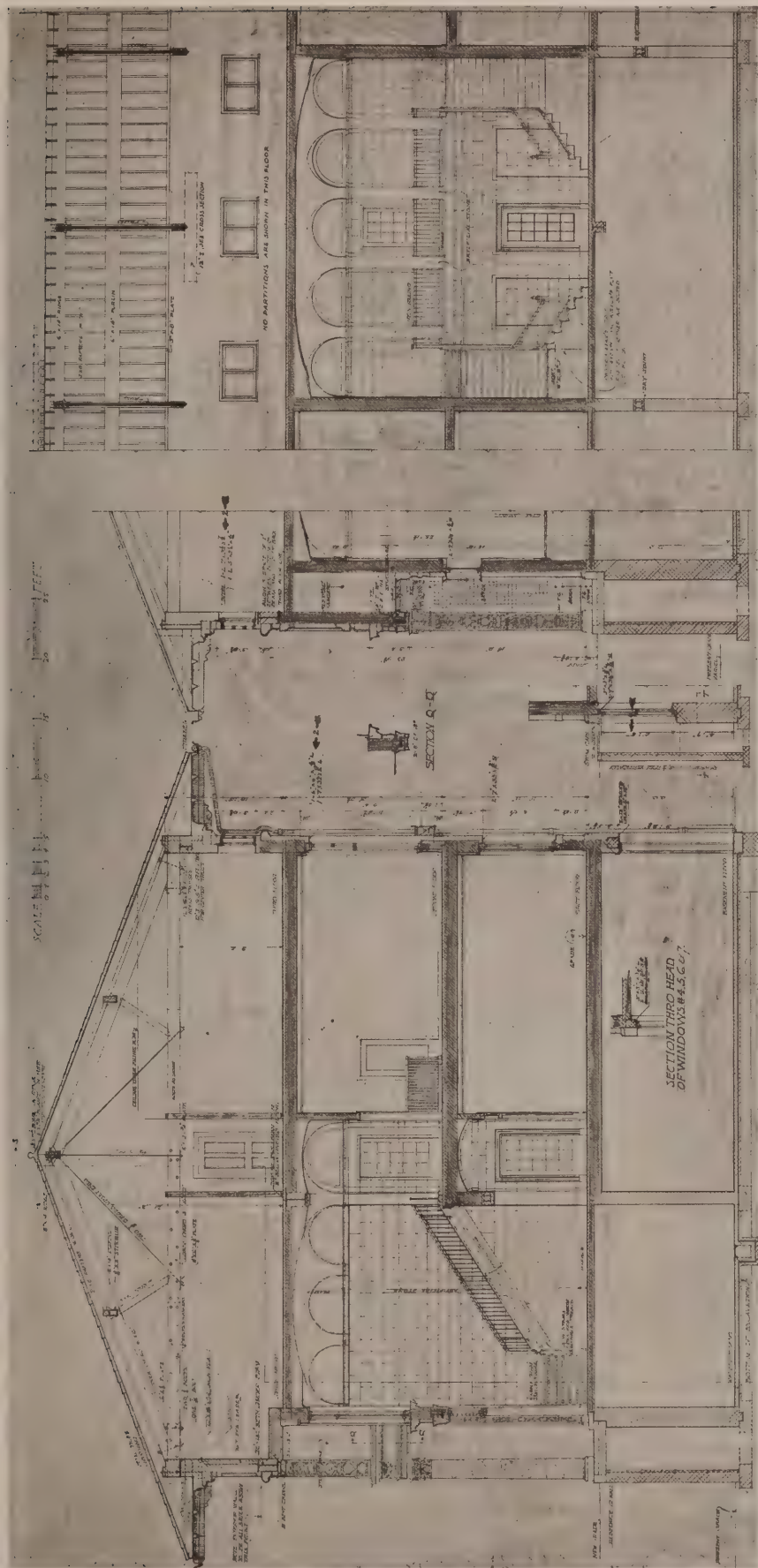












SECOND FLOOR PLAN

FIRST FLOOR PLAN

BASEMENT FLOOR PLAN

ADMINISTRATION BUILDING, ESSEX COUNTY PARK COMMISSION, NEWARK, N. J.

H. VAN BUREN MAGONIGLE, ARCHITECT









SECOND FLOOR CORRIDOR



STAIRWAY AND ENTRANCE HALL

ADMINISTRATION BUILDING, ESSEX COUNTY PARK COMMISSION, NEWARK, N. J.

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VIEW LOOKING ACROSS FRONT COURT

LINDEN COURT, ST. MARTINS, PHILADELPHIA, PA.

EDMUND B. GILCHRIST, ARCHITECT

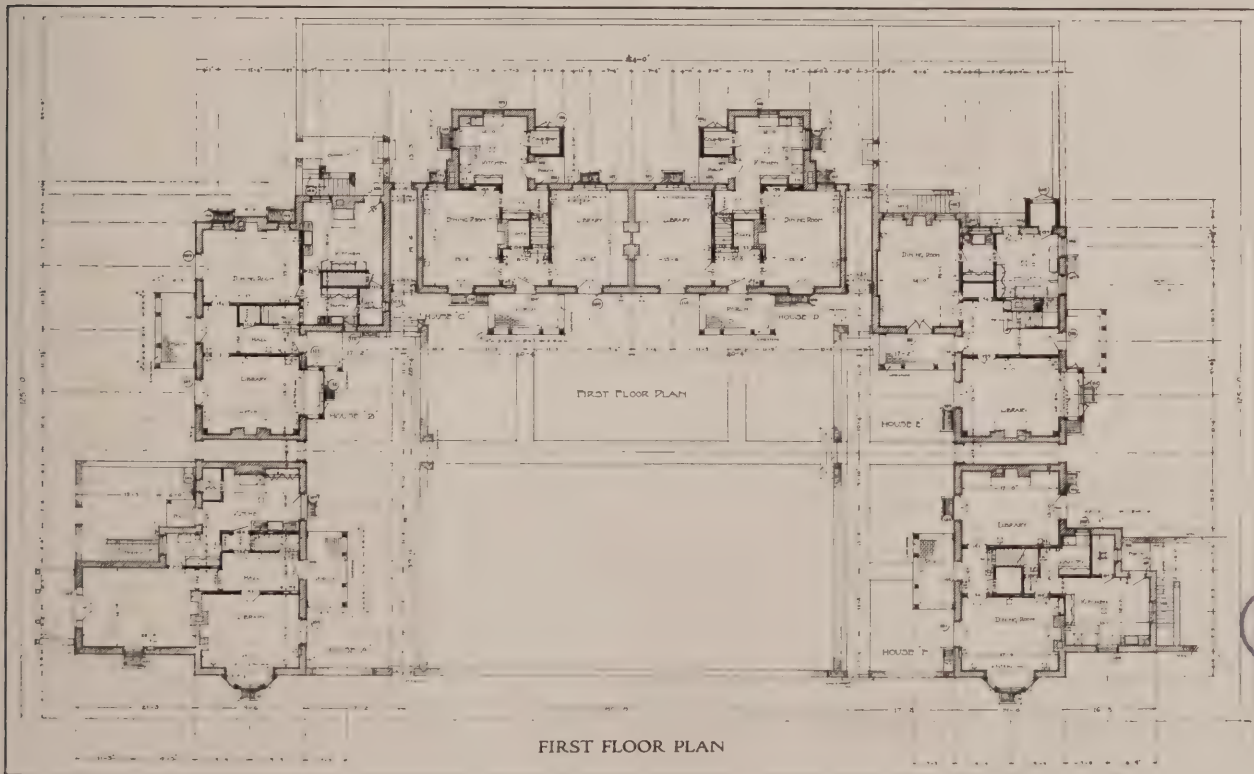








VIEW LOOKING TOWARD LEFT FROM WILLOW GROVE AVENUE



FIRST FLOOR PLAN

LINDEN COURT, ST. MARTINS, PHILADELPHIA, PA.

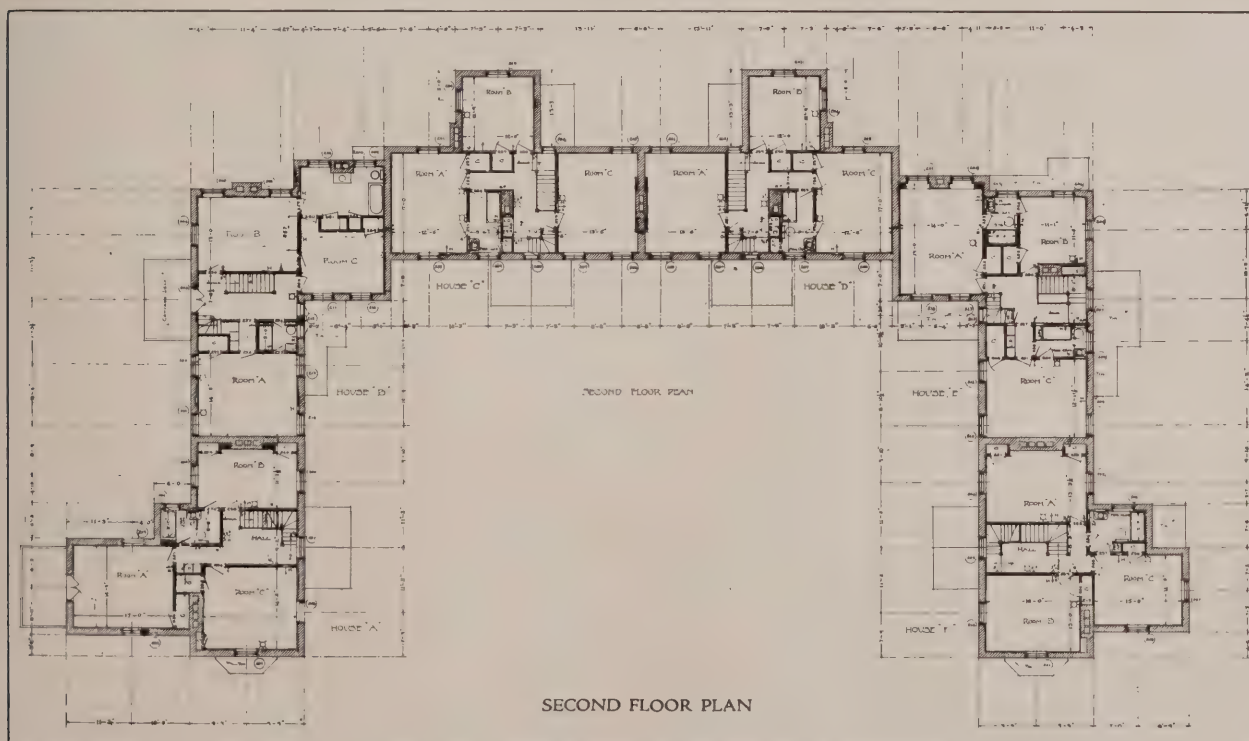
EDMUND B. GILCHRIST, ARCHITECT







VIEW LOOKING TOWARD RIGHT FROM WILLOW GROVE AVENUE



SECOND FLOOR PLAN

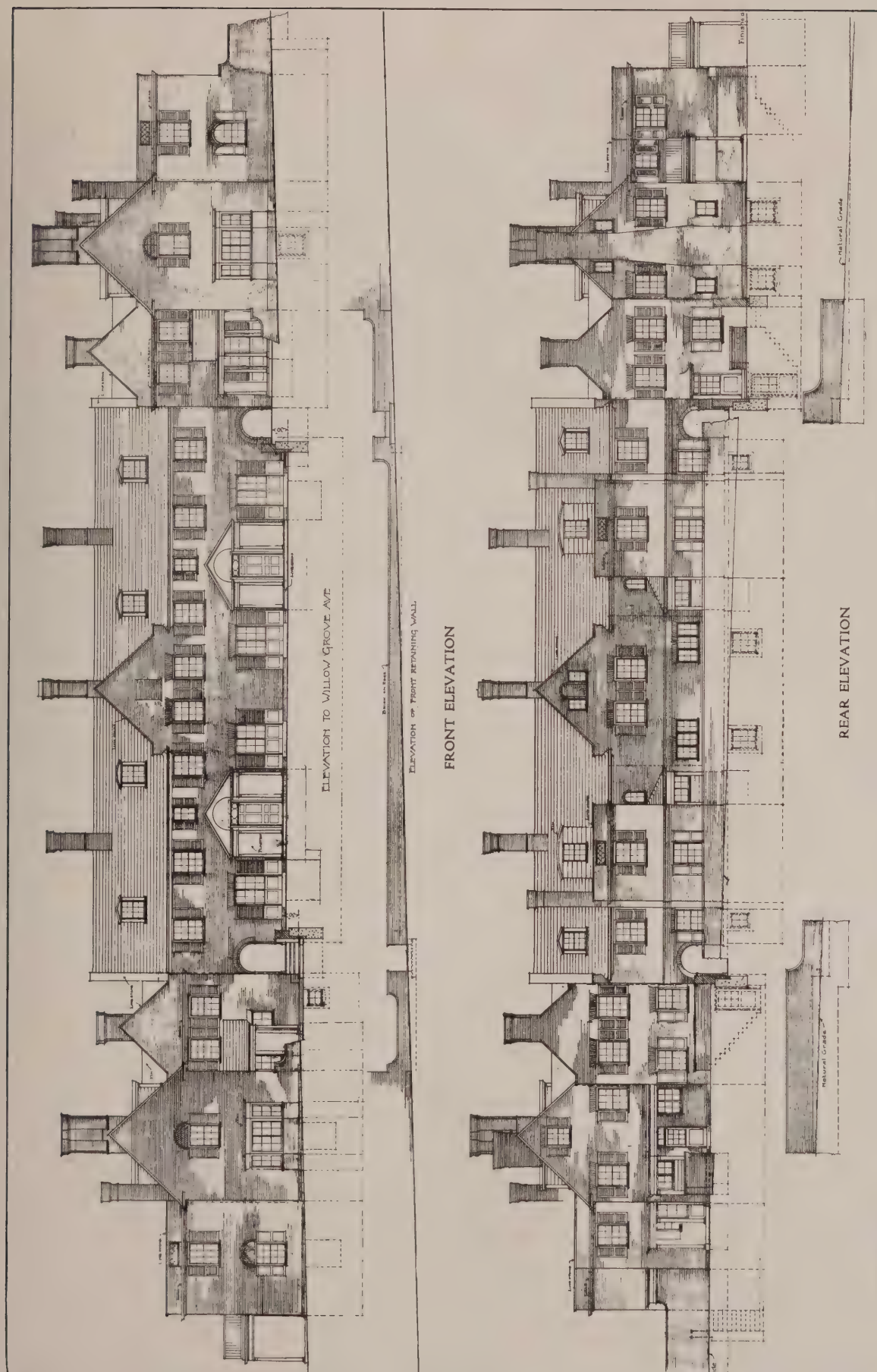
LINDEN COURT, ST. MARTINS, PHILADELPHIA, PA.

EDMUND B. GILCHRIST, ARCHITECT









LINDEN COURT, ST. MARTINS, PHILADELPHIA, PA.  
EDMUND B. GILCHRIST, ARCHITECT









DETAIL OF HOUSE AT LEFT CENTER

LINDEN COURT, ST. MARTINS, PHILADELPHIA, PA.

EDMUND B. GILCHRIST, ARCHITECT







VIEW FROM REAR SHOWING GARDEN TREATMENT

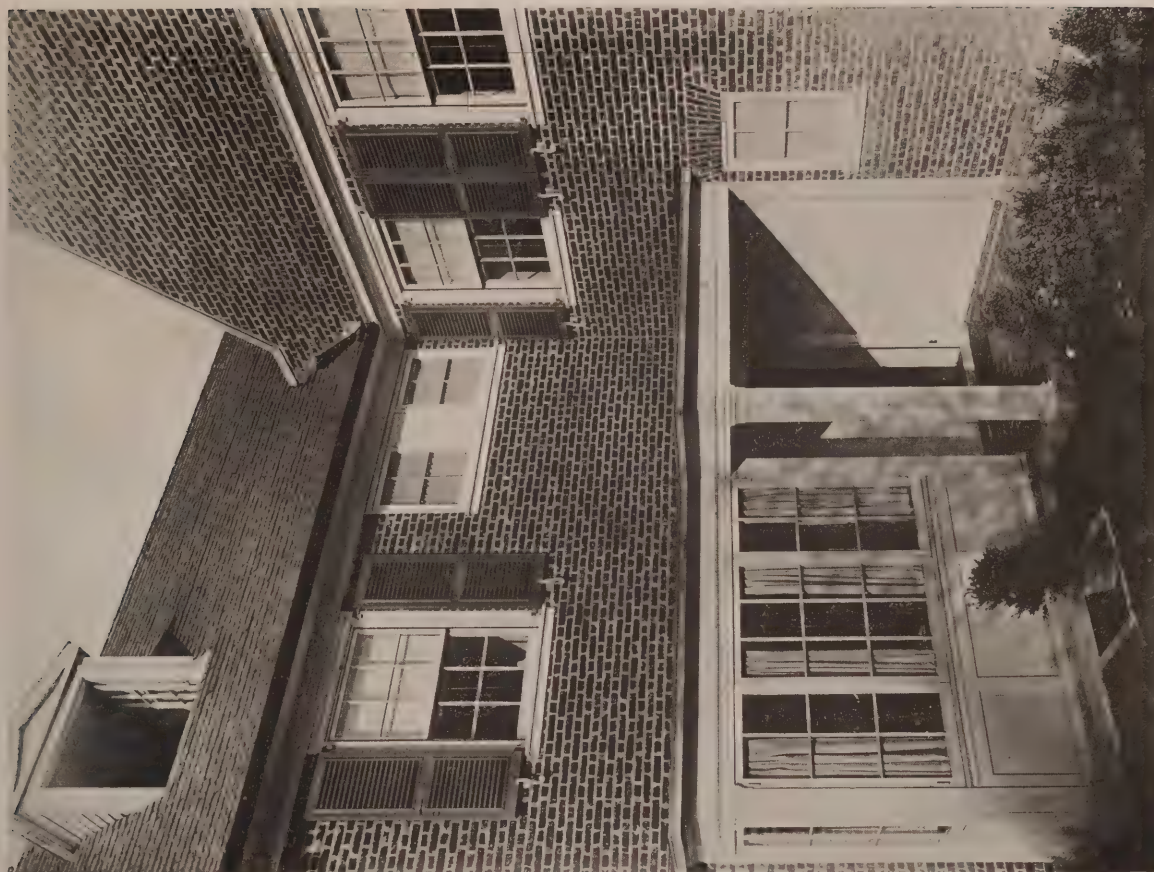


VIEW LOOKING ACROSS COURT FROM LOWER LEVEL  
LINDEN COURT, ST. MARTINS, PHILADELPHIA, PA.  
EDMUND B. GILCHRIST, ARCHITECT









DETAIL OF ENTRANCE AND BAY WINDOW



VIEW OF A REAR COURT AND GATE

LINDEN COURT, ST. MARTINS, PHILADELPHIA, PA.

EDMUND B. GILCHRIST, ARCHITECT









LIBRARY LOOKING TOWARD BAY WINDOW



LIBRARY LOOKING OUT TO GARDEN



DINING ROOM

INTERIORS OF ARCHITECT'S OWN HOUSE

LINDEN COURT, ST. MARTIN'S, PHILADELPHIA, PA.

EDMUND B. GILCHRIST, ARCHITECT.







## Linden Court, St. Martins, Philadelphia, Pa.

EDMUND B. GILCHRIST, ARCHITECT

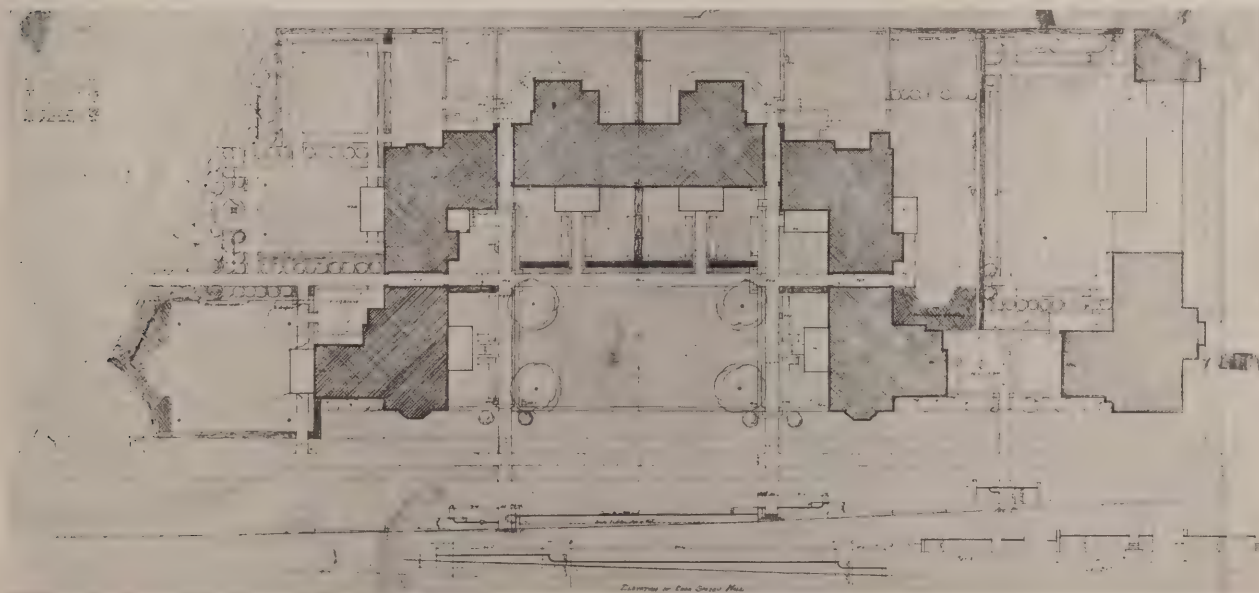
By HAROLD DONALDSON EBERLEIN

A PRACTICAL example of judicious planning, reasonably rewarded by profitable rentals from satisfied and permanent tenants, is the group of brick dwellings at St. Martins, Chestnut Hill, Philadelphia, illustrated in the preceding plates. In examining this unit in the development of a residential tract, known as St. Martins Green, the clearest conception of its full and exact significance will be gained first by noting the purpose of the general scheme of which it is an integral and important part, next by surveying its execution in detail, and, finally, by pointing out its thoroughly practical value as a precedent suitable for emulation and adaptation in dealing with further solutions of the vexed question of suburban or semi-suburban domestic building.

St. Martins Green is the happy solution of a double headed problem — the meeting of housing needs, through speculative building for tenancy, worked out in conjunction with a coherent program of city planning. Because of the seething agitation over housing conditions in tenement districts and industrial settlements, we sometimes fail to realize that there is a housing need in our cities for people of moderate or comfortable circumstances, and that it is a very real problem more and more insistently crying out for solution. The accomplished work about St. Martins Green proves

that housing of this character may be satisfactorily and profitably provided by so-called speculative building under the right direction, and that the process is perfectly compatible both with legitimate architectural ideals and with sane neighborhood planning aims. Thanks to one controlling and directing influence, in the person of the owner, it was possible to make proper allowance for the lie of the land in planning for conveniently arranged groups of houses, each group a consistent and complete unit within itself, and all the groups bearing sufficient relation to each other to ensure harmony in the whole composition. Three architects — Messrs. Edmund B. Gilchrist, H. L. Duhring, Jr., of Duhring, Okie & Ziegler, and Robert Rodes McGoodwin — were invited to collaborate in preparing a plan for the green and for the grouping of the houses to be erected on the adjacent land. The several groups were distributed among the three architects, and amicable collaboration with sufficient latitude for each to work out the expression of his individual conceptions in his own groups produced as much unity as was desirable in the whole undertaking.

Linden Court, the brick group with which we are here particularly concerned, occupies a plot of ground, facing south on Willow Grove avenue, 225 feet long by 125 feet deep, the land sloping



Plot Plan of Linden Court, St. Martins, Philadelphia, Pa.

Edmund B. Gilchrist, Architect

*The house shown at the extreme right, while not essentially a component part of the group, was designed and so located as to be a connecting link between the group and the neighboring houses.*



Porch at Rear of Architect's Own House

slightly to the southwest. Had the owner wished to do the ordinary, conventional thing, it would have been possible to build thereon two groups of twin houses, allowing for each a lot  $56\frac{1}{4}$  feet wide by 125 feet deep, or, if five houses had been squeezed in, each could have had 41 feet front. In any event, there could have been no particular individuality in the scheme, there would inevitably have been certain undesirable features, and a portion of the ground at the rear would have been incapable of fulfilling its largest usefulness. The cost of construction would have been quite as much and probably more than the cost of the sextuple grouping around three sides of a quadrangle. The plan adopted, however, besides possessing the merits of individuality and architectural charm, along with manifold other points of commendation, makes the most economical use of the ground by providing for *six* houses, instead of four or five, by utilizing the full *depth* as well as the full width, and by giving all the dwellings the common advantage of what would otherwise have been an unattractive expanse of back lots. The cost of con-

struction for the group was 22 cents per cubic foot, including plumbing and heating.

The plans and illustrations will, in the main, tell their own story, but some supplementary explanations and discussion are also necessary. The sand faced bricks of the walls, laid in Flemish bond, were not selected for color, but followed the ordinary run of the kiln with such variation as chance gave. The trims are of buff Indiana limestone. For the exterior woodwork, cypress was used, painted white with the exception of the shutters, which are a dull and moderately light green. Soft yellow poplar was used for all the interior woodwork and painted white. The flooring for all the porches is of smooth red 6 by 9 deck roof tiles laid with wide cement joints. Beneath the porches the house walls are smooth stucco, whitened, and the texture here, as everywhere else both outside and in, has been kept smooth, as roughness reduces apparent size. The roofs are of gray slate.

An inspection of the plans will show that the houses differ with the exception of the two middle ones on the long side facing south, which are virtually the same in their interior arrangements. This was done because the problem of orientation in each case required a different solution; incidentally greater individuality for each house followed as a result. The arrangement of

the houses about three sides of a quadrangle assures the maximum of light and agreeable exposure to each house and to every room in each house. There is scarcely a room in the whole group that has not two exposures. One admirable feature, so far as abundant light and ventilation are concerned, is that the houses are not deep, but spread out with long fronts.

Although the group has been pushed back as far as the depth of the plot would allow, so as to leave all the space possible for the individual gardens and the common grass plot in the quadrangle, enough room for all utilitarian purposes has been left in the kitchen yards where the brick enclosing walls are high enough for privacy, but not too high for ventilation and clothes-drying.

In design, the back of the group displays little less architectural charm than the front, and Mr. Gilchrist has treated several features in such a way that they agreeably remind one partly of Queen Anne's Gate or Grosvenor Road, partly of Mr. Lutyens' facile touch. Again, quite unlike any reminiscences from any of these stimulating



sources of inspiration, we find refreshing bits like the latticed, double decked porch on the garden front of the architect's own house. The general Queen Anne, Early Georgian aspect of the whole composition has a peculiarly appropriate local association, for Philadelphia is steeped in Georgian tradition. And yet there is nothing about the Linden Court houses, either inside or outside, to suggest pedantic reproduction. Indeed, on the contrary, there is noticeable the utmost freedom in the handling and adaptation of precedents drawn from various sources, and all of them are compacted into a perfectly congruous whole. To give but one or two instances, nearly all the doors in the interiors are paneled after an old French manner with one large panel below and another large panel above, and the two separated by a lock rail. The mouldings, however, are English rather than French. Again, the shutters are Georgian in dimensions, but the heavy, fixed slatting, obviating all unpleasant rattling, is Italian in type, and, it will be noted, is held in place by chunky cock moulds.

The houses, to be sure, are small, but everything possible has been ingeniously done to allay the sense of smallness by restraining the scale of all details. The work has been done in a subtle way and is thoroughly effective. Instead of detailing the door and window trims, the door panels and other similar items in a scale one would customarily employ in a room of ordinary dimensions, the proportions have all been pared down and attenuated to lines of rather unusual refinement. The result is agreeable and there is a perceptible gain in apparent size. In this connection, it is worth noting that door and window frames are set in flush with the surface of the wall and display only the slightest projection of moulding beyond the wall surface. Still further, the fenestration has been so disposed that there are enough unbroken wall spaces to assist the sense of roominess and incidentally to facilitate the operation of furnishing. By judicious planning and the employment of these subtle aids, the interiors have been endowed with an atmosphere that creates the impression of size.

One of the most commendable features of the plan, one that assures a maximum of privacy and one, doubtless, that has appealed with unusual force to the occupants, is the complete freedom and independence of outlook of each of the houses. Another factor that contributes to the sense of privacy is the position of the [houses on three different levels; the variations in grade along with low brick retaining walls give enough

separateness to prevent the too intimate contiguity of a Pomander Walk. The occupants of Linden Court are not forced by circumstances into one another's company, and, if they wish, they can live to themselves quite as well as though they were in an apartment house. One architect, in fact, when he first saw Linden Court, described it as an apartment house spread out over the ground instead of built up in the air.

The single house shown on the plot plan and connected with its garage by a pergola and



Detail of Lattice Porch

garden wall, at the corner of Willow Grove avenue and Crefeldt street, while not a component part of the group was designed in harmony with it. Being partly of brick and partly of stucco, it serves as a connecting link between the Linden Court group and the stucco houses opposite on the far side of Crefeldt street.

For obvious reasons it is not permissible to state the rents, but it is permissible to say that they are of an amount to make the court a paying investment, and that they are somewhat higher than the rents of houses of larger size built in rows, in true speculative builder style, not very far distant. The wisdom of the whole policy of building houses of real architectural worth for renting purposes has been tested and proved by ample experience in the vicinity of St. Martins, and the same condition would prob-



View Looking through Alley Across Front Court

ably be found to obtain elsewhere equally as well.

In the case of Linden Court, it was a happy stroke to put six houses, each producing a good rental, where under conventional conditions only four, or, at the most, five houses could have been placed. Over and above that it is an achievement worthy of emulation to create a group in which every feature of the site and of the buildings is made to count for its utmost practical and artistic value; a group whose each unit has individuality and privacy; a group whose occupants, whether they analyze their feelings or not, are evidently responsive to the architectural appeal to their imagination. Linden Court is veritably an exemplification of the truth that beauty pays, and that there is no legitimate reason for the desolation of the usual speculative domestic buildings.



View of Linden Court from the Rear

Edmund B. Gilchrist, Architect



# The Problem of the General Contractor

By WILFRED W. BEACH

*IN the previous paper the author discussed the relations of the architect to the contracting system and the evils which have come about in its practice to-day that seriously affect the profession of architecture. In this article he considers the encroachment on the architects' legitimate field by the cost-plus contractor, which adds another phase to the serious problem confronting architects. — Editors.*

IF A contractor, fully equipped to serve his clients to their best advantage, has built up for himself a reputation for fair dealing and finds that he can get work from them at first hand, why should he trouble himself to hold up the hands of architects none too friendly? Why should he submit himself to the insulting inferences of the general contract form and bond? Following the line of least resistance, is it not much simpler for him to dub his head-draftsman "architect" and proceed accordingly? And is this not made especially easy by reason of the fact that at least half the practitioners of the profession, unbridled by law or public standards, are unworthy the appellation to which they lay claim?

What is an architect but a creator of structures? Is this head-draftsman any less an architect because his remuneration touches first the hand of the contractor after it leaves the owner? The report of the Institute Committee on the relation of architects to the contracting system, cited in the previous paper, advises us that the "biggest" architects in the country are often employed and directed by the contractors to whom they are supposed to dictate. How are the mighty fallen!

What next?

The builder of high class and good repute, who thus departs from the bellicose career of the competitive-bidding contractor and embarks on the safe and sane policy of cost-plus building, must first add to his reputation the attribute of thoroughgoing responsibility. He has then gained one very considerable point if he proposes to compete with architects to their elimination, *i.e.*, he can convince his prospective clients that his estimates are dependable, can guarantee them in fact, and can advertise that he does so.

Fortunately for the architectural profession, as the practice is still most generally conducted, the majority of the builders who have thus far elected to try cost-plus advertising have not been of the dependable kind and the public is still wary of them—not forgetting that for decades the contractor, in many opinions, has been the very culprit upon whom the architect has been paid to spy.

Strange concerns, "outsiders," may thus be viewed with suspicion; but if the owner has a friend, a tried and proven builder, who refuses to accept work under the Uniform Contract—will not submit to the decisions—questionable from the contractor's point of view—of a judge whose verdicts are paid for by the owner, then will the latter give up his favorite builder in preference for his less favored architect? Probably not, especially if the contractor is a good business getter and can demonstrate that his architectural department is as good as that of his competitor. All this we have seen explained. Who can say whither it trends?

The head of one of the largest, if not *the* largest, contracting concerns in the country, himself a financier rather than a builder, refuses to see any cause for alarm so far as architects are concerned. He insists that his concern adheres strictly to its own province and asserts that the friendship of architects is of great importance.

Another such head, no less prominent, recognizes the increasing predominance of his own drafting room and admits that, on simple structures, incidental to general engineering construction, they find it unnecessary to call in an architect, though quite willing to do so, if the client prefers.

Another frankly admits that, although on friendly terms with many architects, he does not hesitate to offer the services of his own, if by so doing he can land a job before it gets out of reach in an office where it will go to competitive bidding.

Still another freely admits that his firm is at war with all architects, and secures what work it can by belittling them and exaggerating their shortcomings.

These are the attitudes of the "big fellows." Diligent interrogation will develop the fact that they are typical all along the line. It is easy to draw any kind of a conclusion according as one's own opinions are backed up by the methods of practice of any of these builders.

Now it is quite possible to conceive that the "architect" in such an organization, if a man of well rounded ability, might work up into the management and control of the machine. The fact that such manager has generally been a practical builder or a clever financier argues not against it. When such a thing shall come about, what will be the status of that architect?

When is an architect not an architect? When he becomes a constructionist? Why should that be? What makes it so?

Evidently naught but the dictates of a code of ethics.

But is it not possible that a revision of such an ethical code may reveal to us the "constructing architect" and the "consulting architect" where we have now only the latter? The engineering profession accepts this classification, then goes farther and carries its operations well into the field of architecture proper, competing with both architects and contractors.

If the builder is to usurp the functions of the architect, why should not the architect reciprocate and carry his work into the field? He can and does, but not to the extent that he should. He does it either by a reversion to the separate contract method or by himself becoming the cost-plus builder. He can do either without violating his stringent code of ethics, though that code cripples him in the solicitation of business in competition with builders not so hampered. But he must realize fully the added expense to himself of carrying on such work by either method. It is such service for which the general contractor exacts his 5 to 15 per cent. And for this purpose the general contractor is supposed to possess an organization and equipment capable of tying together the work of the various independent trades. The architect has no such organization or equipment and finds difficulty in persuading the owner that they are not needed, or that the architect is entitled to an added commission if he undertakes to provide same, or for looking after more numerous separate contracts. Some architects have met this difficulty by taking bids on both general and separate contracts and proving that the combination of separate figures foots up less than the general contractor's total—as it should, by the difference in the amount of his profit. The architect should also be able to give the owner lower bids from branch contractors. Not that such bidders will deliberately figure lower for him, but that the general contractor does not ordinarily get many sub-bids in each line *before* the job is let. He neither has time nor blueprints enough. After the letting, he takes time and is often not too scrupulous about playing one bidder off against another in a manner he would not for a moment tolerate in connection with his own bidding. The owner gains no advantage from this.

A certain material man states that he makes it a point not to give a general contractor his lowest price before the letting, as it would only be used

for a guide by which his competitors could adjust their figures. To what extent such practice is indulged would be difficult to guess, but it is a notorious fact, as mentioned by the A. I. A. Committee, that many general contractors operate entirely on the capital of the supply houses with which they deal and that they are perforce compelled to give such concerns preference in buying. The architect can be supposed to be free from such bias and can let his contracts without favor, with every advantage to the owner.

But while it may or may not be essential that the architect furnish this field service at a lower price than can be done by the general contractor, nevertheless the former must, if he undertake it, do it as well or better. This would seem to mean that he must be prepared to furnish the miscellaneous equipment and backbone of the building organization, now supposed to be in the true province of the general contractor.

In doing this the architect becomes at once a cost-plus constructionist exactly as a contractor so operating. For cost-plus service is no more or less than the day-work of aforetime, dignified and extended.

In spite of the fact that the typical owner is proverbially squeamish and suspicious when embarking on a building venture—has been so for ages—yet in all ages there have been men with sufficient confidence in their chief artisans to permit them to carry on their work without previously fixing a price. Such day-work building was supposed to bring better results to the owner because the contractor could have no object in skimping the job. If rigid economy was not an essence of the operation, the main objection thereto was eliminated.

The ordinary method of charging for such work was for the contractor to exact an advance of ten cents an hour on each man's time over the price actually paid him, the owner also reimbursing for all material as billed. It was assumed that the builder enjoyed a profit on the latter, though it cannot be said that any particular percentage was customary. The arrangement was based solely on the belief of the owner that the contractor would treat him right. Naturally it was often productive of misunderstandings, disagreements, and lawsuits.

This manner of building was chiefly confined to residences, alterations, and such minor construction. When architectural service was employed incidental thereto, the architect rarely attempted to audit accounts; it was not required. In fact, he was seldom urged to superintend the work.



Naturally, in a method which gave him little authority over the builder and which brought but part pay for part service, the architect had small enthusiasm. Then too, without a schedule of costs in his file, the architect was at the mercy of the owner in determining the amount on which the fee should be reckoned.

Of course, as in cost-plus building, the owner had no guaranty as to how much the work would cost nor when it would be completed. It is alleged that mechanics and their foremen work appreciably more slowly without the stimulus of an exacting contract, hence that the expense is also appreciably greater.

The evolution of day-work building into cost-plus construction is quite modern, though, as we have seen, the latter is merely a rendering of the former into more businesslike shape. The same basic principle is at the bottom of both plans and is the direct antithesis of the fundamental of competitive bidding contracting. The present general contract form presupposes the dishonesty of the contractor, and guards or seeks to guard against it. Cost-plus agreements carry the presumption that the builder is honest, as well as capable, and entitled to the confidence of his employer. In fact, in this sort of building construction the contract is merely a memorandum of the understanding existing between the parties thereto. It is quite impossible to write an iron-bound contract for any cost-plus arrangement. No scheme of supervision can be evolved to cope with it if the contractor wishes to swindle. The interjection of a third party solely for the purpose of "keeping the contractor honest" is superfluous. It can't be done any more than that the best of detectives can safeguard the honesty of any purchasing agent. An attempt to do so would necessitate parallel auditing—a considerable expense and quite useless because not sufficient for the purpose. It would make the builder more *careful*; that is all.

Under a lump-sum contract, with a guaranty bond, the superintendent has to see that the contractor builds according to drawings and specifications, has to pass upon the merits of material and workmanship, explain uncertainties, keep the work of different contracts dovetailed, and see the owner secure from mechanics' liens.

Under a cost-plus agreement how are these duties multiplied? If an architect undertake to superintend such construction, he must do all the foregoing, and must besides see that the buying is right, that the laborers are properly paid and do not shirk, that there is no waste or "shrinkage" of material, that time and other accounts are

properly kept, and that the payment of bills incurred in the work covers no concealed rebates.

Verily, a Herculean task!

Probably the only reason that an architect would wish to supervise such construction would be to see that the spirit of his creation were not lost. But it is difficult to bring the lay mind to realize that all serious architectural work is truly creative, which is to say experimental and evolutionary, and that the designer must follow the execution of that work to its end in order to be sure that the solution of the problem is the best possible in every minute detail. Not appreciating this, few owners care to pay for such manner of supervision. They may be too prone to think it a good deal like asking pay for architect's mistakes, or their avoidance. An owner must be broad minded to get the architect's view-point.

Taken from all angles, there can be small room for wonderment that architects do not take kindly to cost-plus systems. Even though they recognize the theoretical justice of such a plan, they also realize how impracticable it is according to present-day methods.

Another reason why architects taboo cost-plus work as a general proposition is that few of the contractors with whom each has dealt have inspired these architects with sufficient confidence to warrant their unqualified indorsement as purchasing agents of labor and material in a truly altruistic spirit. The system in vogue produces too many of the other sort.

Yet the owner, having acquired the habit, under his modern business methods, of placing confidence in the individuals with whom he deals, *does* manifest a willingness to extend that confidence into his building deals, and the architect runs danger of being set aside if he object too vigorously.

Then again, the next step, the architect *is* once more set aside and this builder, in the arrogance engendered by the confidence thus placed in him, also usurps the functions of the architect, and cost-plus building likewise proceeds without him.

Thus, we see, in addition to the great contracting companies mentioned by the A. I. A. Committee and their smaller counterparts, a new growth of building companies organized with the intent of furnishing architectural service. These are not contractors, properly speaking, but "cost-plus constructionists."

Cost-plus construction varies in form, depending upon the outcome of the preliminary arrangement between owner and builder. While it is true that the acceptance of any such method is subtended by the confidence of the owner in the

constructionist, it does not inevitably follow that the latter merits that confidence. In fact, many of the mushroom concerns of this description that have recently come to the front appear to depend more upon their advertising and other propaganda for the getting of new business than upon the integrity of their performances. Seemingly the most able employees of such companies are their advance agents—their traveling salesmen.

Conferring with these individuals, it is discovered that they have no fixed price or scale of prices. It is their business to make the best deal possible, *but to make the deal*. It is with such a one as with the shyster architect, there is money in the job at any price. The abuses already grown into the system are so great that it is undoubtedly safer for an owner to turn his work over on a cost-plus basis to any responsible contractor of his acquaintance rather than to risk falling into the hands of the business procurer of the wrong sort.

The latter may submit any kind of a cost-plus plan for consideration. At first he will offer to take all the burden of the work off the owner's hands, pretending that he is thus going farther than architects do, and for this service exact a "modest honorarium" of anywhere from 10 to 20 per cent of the total cost of the work. He then proceeds to elucidate the advantages of his method, more especially as practised solely by his organization, making these sufficiently numerous to offset the loss of a lump-sum contract—of not knowing exactly what the structure is to cost.

"Our complete organization of experienced and efficient architects, engineers, and mechanics, and our superior advantages in purchasing, due to the enormous quantity of our buying, enable us to deliver your finished building at a much earlier date and a much lower cost than you could possibly accomplish by the old method. In addition to which we save you the 5 or 6 per cent you would have to pay a first-class architect. Our chief architect is as good as the best and his forces are mostly college graduates. Besides which, we have a first-class corps of engineers which your local architect has not.

"Moreover, we save you from being fleeced out of 50 to 100 per cent profit on your extras, which are inevitable under the old system. You know some contractors rely solely on their extras for the profit on the entire work. Others just make 'velvet' of it, but you save all that by our method. You can have all the extras you like and they go in at the same rate as the balance of the work."

"But I don't want *any* extras. My last building was done by a local architect with only fifteen dollars for extras, offset by fifty-odd dollars deductions. The contractor didn't get rich off that."

"No, perhaps not; but you see we have all these other advantages, including the considerable saving in rent by starting your construction immediately, without having to wait three or four months for your architect to prepare plans and get bids."

"Now," says Mr. Cautious Owner, with awakening interest, "you've hit the spot. I want to move into my building and rent the upper floors just as soon as possible—have half the space spoken for now. But I must know first how much it is to cost."

And they're off.

It does not occur to Mr. C.O. that hurried owners could always have started their construction coincidental with their planning, and would have more often done so, were it not for the superior advantages of having the drawings completed first.

In other ways Mr. C. O. is not too trustful—is somewhat wary, even though persuaded, largely on account of quantities of expensive literature concerning other work handled by this company, to employ the strangers. He wants to know just when his building will be completed, how much the gross cost will be, and just what is to be included in that cost. Furthermore, he suspects that the smooth emissary has not named the lowest fee for which his company will undertake the work. After further dickering, he finds this to be true and also learns that they are willing to have the amount fixed as a lump-sum. This they make 6 per cent of the estimated cost—they would have done it for 5, had he but known.

Next Mr. C. O. discovers that he is not really saving the cost of architectural service *in toto*, but that he is expected to pay for drafting, blueprinting, and typewriting as part of the work of contractor's forces. So he now insists that it be made plain as to what "overhead" and office expenses are to be charged against him.

These various points having been agreed upon, a time for completion set and an estimate of cost made, they proceed to the owner's lawyer to have a contract drawn. This worthy, not being thoroughly familiar with building construction, overlooks the fact that it is impossible to make a binding contract without having working drawings and specifications upon which to found it—and the further fact that the proposed agreement is one of mutual confidence in which the owner is bound to execute his part, whether the other party reciprocates or not.



The lawyer prepares a form and submits it. The owner insists that the maximum cost guess and the minimum time guess be made binding parts of the contract. To this the agent smilingly consents and offers not only to guarantee the cost, but to ask no commission on any overrun "except in case of considerable changes and construction not originally contemplated."

The contract is signed and the work begins.

Behold at once a "make-ready" more elaborate than anything heretofore seen in the locality. The owner consults his contract, the only guide he has, and finds nothing on the subject. He finds a considerable office force maintained in a large temporary office at the building, and discovers it to be a sort of headquarters for the preparation of sketches and the soliciting of work in that locality. But he cannot find whether or not he is paying for time so spent, though he knows he is furnishing free rent for the purpose.

He also finds "considerable changes and construction not originally contemplated" from the very beginning when \$10,000 is demanded for piling not at first thought necessary. The building is carried to completion four months after the date set and at a cost considerably above the original estimate. The owner learns that his "contract" was no contract at all, except as it carried his own obligation to pay, which he does. Being a "good sport," he takes his medicine and keeps still, even when his demand for a statement that can be audited is met by the naive rejoinder of a "certified" accountant—in the employ of the builder—to the effect that, inasmuch as he discovered that the builder had not made his stipulated fee out of the work, no further statement is necessary.

And because Mr. Cautious Owner keeps still or has not done other building with which he can make comparison, the cost-plus plan of building is apparently growing in favor. This must be simply because it appeals to some business men as a fair and just way of undertaking a building venture. Not being thoroughly versed in building matters, they cannot realize how remote we still are from the ideal conditions upon which sound cost-plus construction must be founded. Even those concerns working under such system, which may be assumed to be absolutely honorable in their intent, find that intent circumscribed by two difficult entanglements. They may administer their business affairs in the most approved fashion. Their drafting room may be presided over by a man quite deserving of the title of "architect," and the designers and draftsmen under him may be as good as can be had. And they may thus

offer formidable competition to the highest type practitioners whose ethical scruples forbid the too assiduous soliciting of business—business soliciting being ever the most highly developed department of the cost-plus builder.

But they have not yet been able to practise their own preachments and award sub-contracts on their structures in the same manner their own work was taken; nor have they been able to control the militant building trades union.

Now if it be probable, as some prophesy, that the cost-plus plan of building is to continue with a steady growth and eventually supplant the competitive system of contracting, it behooves the architect not only to determine his place in the scheme, but to do as the A. I. A. Committee suggested—begin to deal with the men who do the work.

Militant trades unionism has made longer strides in the building trades than in any others largely on account of the general contract system. In other lines the delegates of unions have dealt directly with their paymasters, thus encountering more resistance. In the case of the contractor, his output had no fixed price and he cared little what he paid his men, just so it was not in excess of what his competitors paid, and that no change in wages came on work already contracted for. The result was that union victories were easily won, and understandings easily effected whereby associations of contractors employed only union men, who in turn would only work for association employers. Such understandings, illegal though they be, are still in force in some of our large cities.

Whether we as individuals worry most over the high cost of champagne and grand opera seats, or are skimped to pay for gasoline and movie tickets, few of us are complaining because of the high wage of any one else. Why should we worry if the brick mason and plasterer draw more per week than the college graduate who so skilfully and sketchily crosses his corners on tracings the while he forgets to check the adjoining figures? If the latter preferred to do the work with a trowel, no doubt he could change his calling. Some have done it. Others should.

But where the architect and owner have just cause for complaint against the labor unions—and this strikes at the root of their present form of organization—is that the principle they labor the hardest to inculcate in their propaganda teaches the utter selfishness of their motive—the rendering of minimum service for maximum toll. So thoroughly is this principle rendered into practice

that the apprentice no longer exists in the building trades; he has almost disappeared from the shops.

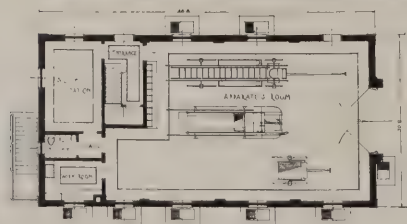
Already we have a dearth of skilled men on our structures, competent testimony as to the efficiency of their methods. Everywhere architects complain of the low class work offered for acceptance and only in the largest cities is better to be had. And here is the problem that architects must squarely face, sooner or later.

The architects of the large cities are the last to experience this scarcity of good mechanics; hence, inasmuch as the government of the Institute and the shaping of its policies are in the hands of these architects, others must wait for them to act—but the problem must be faced. It must be met regardless of the problem of the general contractor, but must be dealt with more quickly

if the other problem likewise becomes more urgent, because of its fundamental importance.

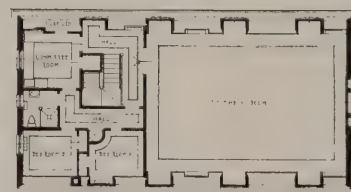
How is it to be met? There seems to be but one way—through the trade schools.

How architects or the Institute will work through these and larger schools of their kind to get an output that will eventually supplant and surpass the present mediocrity in the building trades, should have the attention of an Institute committee at the present time if the profession of architecture is a living thing, having as its aim the production of finished structures as fitting monuments to its genius. If, on the other hand, it be only a livelihood, or a fine art having its satisfaction in its drawings—if it be either of these, let it drift as at present, until supplanted by the more virile, if less ethical, process of the more enterprising builders. To lapse into the vernacular, "Where are we at?"



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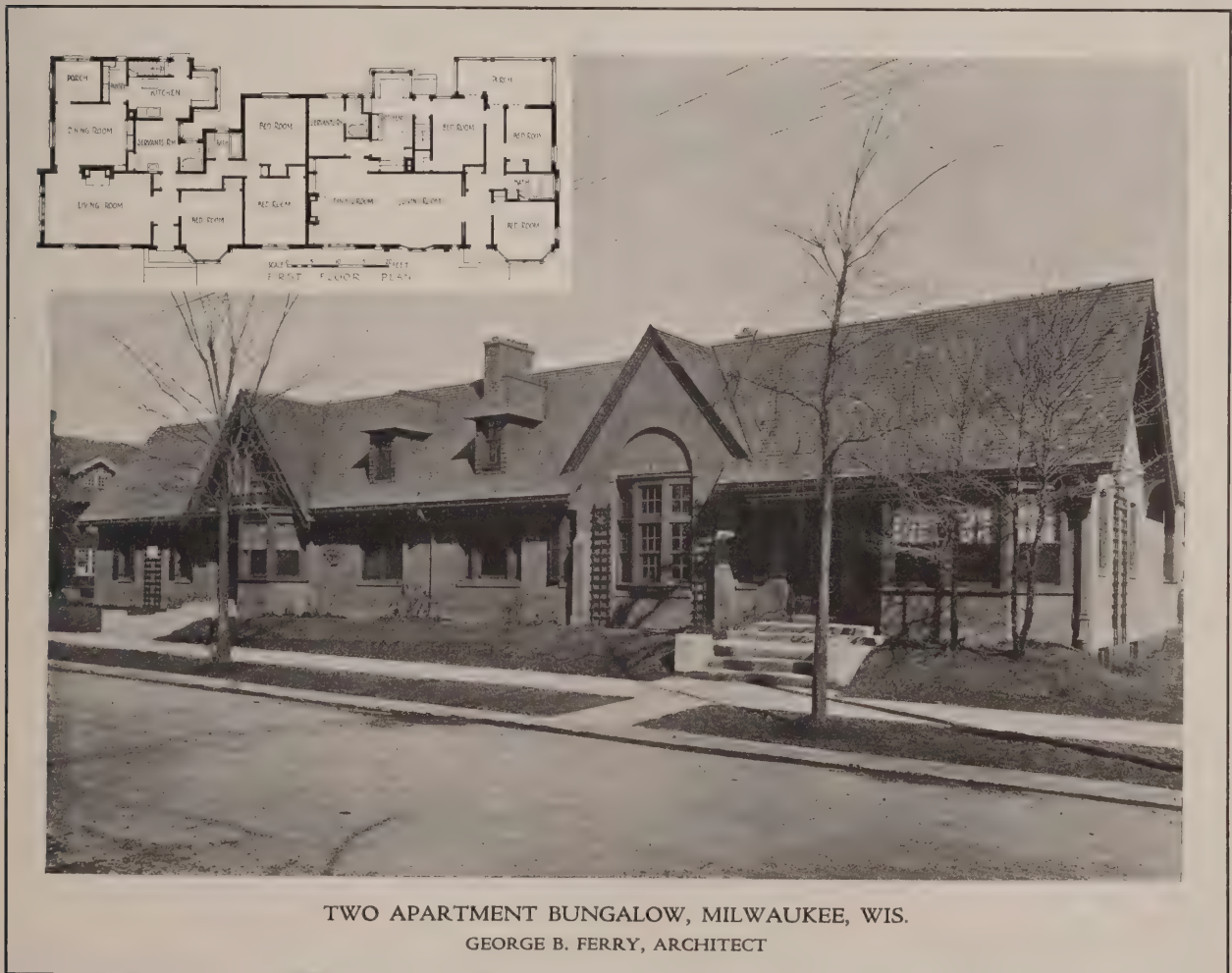
# Administration Building of the Essex County Park Commission Newark, N. J.

ILLUSTRATED ON PLATES 1-8

**T**HIS building, containing offices of the main executives of the Essex County Park Department, is located on a spur of Branch Brook Park at Sixth and Clifford avenues in the city of Newark. The site had a considerable grade from front to back, which permitted entrances to the building on two different levels. The basement garage, work shops, and storage are entered from the lower rear street level, while the main entrance to the first floor is on the upper level fronting on a garden forecourt and the park.

The building contains offices for the Superintendent of Parks and his various heads of departments, together with the associated clerical and drafting forces. It provides, in addition, headquarters for the Park Police and a suite of rooms for meetings of the Board of Commissioners for use when occasion demands.

The building in type is essentially an office structure, and the finish of the interior is consequently of the simplest character. The structural walls, exterior and interior, are of hollow tile, with fireproof floor construction. The exterior facing is of rough textured brick laid in Flemish bond and ranging in color from buff to light brown. The terra cotta used in the cornice, belt courses, and around the entrance is light brown in color, with the ornament executed in low relief. The soffit of the arched entrance loggia and the frieze under the wide overhang of the tiled roof are plaster with allegorical decoration in color, painted by Mrs. Edith M. Magonigle — an example of mural design in harmonious relation to architecture. The frieze is pierced at intervals with windows behind heavy grilles that have been painted and checkered to conform to the colorful devices of the panels.



TWO APARTMENT BUNGALOW, MILWAUKEE, WIS.  
GEORGE B. FERRY, ARCHITECT

## EDITORIAL COMMENT

WITH this number we institute a new size for the page of THE ARCHITECTURAL FORUM. The change is made from  $10\frac{3}{4} \times 13\frac{3}{4}$  inches to  $9 \times 12$  inches. The greatest reduction has been made in margins rather than in that portion of the page which is given over to type matter and illustrations. By referring to the rule shown on this page it will be seen at once just what the actual reduction is in text pages, and again by referring to Plate 1 comparison may be made between the former size and the new for plate illustrations.

In changing to another size we have been influenced by practical considerations, all of which were carefully weighed. It is our conviction that although size and bulk have been reduced, affording greater ease in handling, the value of our work to the subscriber will not be diminished — on the contrary it is our purpose to increase that value. Again by making the reduction, we have approximated the limits recommended for the standardizing of all class publications. Any saving effected as a result of our new page dimensions will be shared, in one way or another, with the subscriber. We feel certain that the step taken is in the right direction; that it is progressive, and that it will enable us to render a larger service at a minimum price. — *The Publishers.*

ARCHITECTURE is one of the few professions which has not constructively organized its efforts in the direction of properly coping with the present unusual situation. When any one cries "wolf," architects seem to adopt immediately a pessimistic policy and draw more closely within their shell and think how bad the future is going to be. This is so injurious to the profession itself and to the public at large that it is time something was done to stimulate efforts and coordinate endeavors with the other fields of industry.

Business is good in most lines. Money is plentiful and may be had on relatively easy terms for legitimate projects, and the real estate market shows strong indications of activity which will increase rather than decrease. There is, then, no real reason why architects acting within the limits of the prescribed code of ethics should find themselves without sufficient work to be remunerative.

It is obvious that conditions at the present time are not conducive to the same volume of business as during times of peace and prosperity. The demand of the government for materials and supplies for the construction of the various buildings, ships, etc., which are now under way or projected, is, of course, unprecedented in our history. Contractors are not able at the present time to forecast what the future prices of materials may be or what deliveries they may expect from factory or mill. Prices are following the economic law of "supply and demand," and are at a point which at first glance seems prohibitive. On the other

hand, there never has been a time in the history of our country when other fields of endeavor were so tremendously overwhelmed with unfilled orders and showed such accumulated profits. The natural tendency and the natural aftermath of the war conditions will be to divert into legitimate, sound business channels these profits which have been made possible by the conditions of war.

Every architect should endeavor to prevent the diversion of the funds accumulated at the present time from real estate and building developments in general and assist in presenting legitimate investment possibilities to those in whose charge the war profits are now placed. The recent bond issue and the subscription to the American Red Cross are sufficient indications of the fact that at present there is no lack of money in the country. This surplus money might well be diverted in part, at least, to building and real estate development channels.

The architect is in the position of an arbiter or judge and his judgment, if sound, affects not only the owner of real estate and the prospective property owner, but also contractors, material men, and labor.

Real estate brokers depend in large measure on the judgment of architects as to the merit of a project and also as to the possible resultant profits. It is imperative, therefore, that each architect should be conservatively optimistic rather than stampeded into a pessimistic view of the building and industrial situation, and form an opinion of



business conditions based on a careful analysis of the real estate and money markets, as well as the material and labor fields.

Suppose that the lack of building should be based on a fundamentally sound economic basis. There are other fields than the commercial and public buildings which the architect can investigate and toward which he can direct his energies. Undoubtedly this would tend to maintain his business and furnish employment to men in his own office as well as men under the direction of the various contractors who would be affiliated with the work.

In war times the building of munition factories, cantonments, base hospitals, and buildings of like character afford an unusual opportunity for the engineer, but this is a field in which the architect should become interested and which belongs to him as legitimately as do commercial buildings and residences.

It may be a debatable point as to whether or not an architect can be more efficient in the construction of factory buildings than the engineer; but it is not debatable as to which is likely to produce the better results, when utility combined with beauty are considered. The architect should endeavor to get some of this work and show to the country that buildings of a similar character constructed by engineers, while possibly beyond criticism from the standpoint of construction, do not present the same attractive appearance as the solution of the problem rendered by the architect.

In such problems architects can efficiently controvert the idea that none but an engineer can successfully build economically and still give the owner the same arrangement and layout so that his business will be conducted with the minimum of wasted effort.

Many laymen consider an architect as an artist who loves to dabble in colors and consider problems in æsthetics and who objects to regard seriously the importance of constructional elements or details of even lesser importance. They also feel that an architect's first tendency is to set aside all ideas the owners may present and force the acceptance of his own opinions regardless of the cost of the completed operations. This is only too true in some instances, but it is not true of the whole profession.

Many engineers regard the services of the architect as an unnecessary and expensive luxury. Why? Because some architects turn to engineers for a solution of the simplest problems which they themselves should be able to solve and which they must solve if they wish to gain business under conditions such as now exist in the building field.

Very many architects hesitate in "going after work," fearing that they would violate the code of ethics of the American Institute of Architects—but this is not necessarily so. An architect has certain legitimate ways of securing business without competition or without entering the field of other architects and endeavoring to steal their commissions. The architect who sits quietly in his office and does only such business as comes to him rather than use all possible efforts to get new business through his own efforts, is the one who to-day is probably most surely criticizing the "high prices" and bewailing his fate.

Prices are high. There is no advantage in trying to argue otherwise. But will they ever be lower, taken as a whole, and under what conditions? If we assume that the price of building materials is the only thing which has advanced, the relative purchasing power of the dollar has been terribly distorted, and an investor would be unwise in doing anything except what is actually necessary in the building or investment line. Such a condition, however, does not exist, and while building materials are high, almost everything else is equally so, and it is plainly the duty of architects to call to their clients' attention the fact that the relation between prices of building materials and other staples is relatively about the same now as it was in 1914 before the war, or as it was in 1897.

In the period immediately following a declaration of war, the countries involved must undergo a readjustment. The extent of this is dependent upon the previous preparation for the crisis. We in this country were not prepared either in a military or a business sense, and it is obvious that our readjustment must be accompanied by a condition more or less chaotic. After the country, however, has fully realized the seriousness of the work before it and adjusted itself to the new conditions, business will move on in as brisk and systematic a manner as before. It is up to architects to do their part. We can afford no "slackers" in the profession. Each one must do all he can to keep business as nearly normal as possible.

If business does not come in fast enough, go out and get it. If estimates come in unusually high, go out and discover the cause and, if necessary, vary construction and materials to produce the desired results. If steel is not obtainable, use something else. Invent new methods of construction or combine parts of various systems. Whatever is done, or left undone, do not complain of lack of business until every effort has been put forth to find it or create a demand for it.

There are in every city many opportunities for building, real estate development, and remodeling which in times of peace are not promoted. These may be brought into the market by a little extra effort on the part of the architect. An architect has ideas which are valuable and there is no good reason why he should not present his ideas through personal effort, provided he respects the ethics and dignity of the profession.

The thing for all members of the profession to do is to "get busy." Nothing can be gained by sitting around waiting for peace, and not much more can be gained by sitting around waiting for business. Present conditions may, after all, develop into an opportunity to show the stuff of which we are made. We must fight by the side of the army and navy and give them support by maintaining business rather than repressing it. *Do your part and do it now.*

### BOOK NOTES

SPANISH ARCHITECTURE OF THE SIXTEENTH CENTURY. By Arthur Byne and Mildred Stapley. 436 pages. 80 plates. 140 text illustrations. G. P. Putnam's Sons, New York. Price, \$7.50.

The period of the Renaissance in most of the European countries has received copious study and attention from the many critics and students of architecture, and it has been a general thought that little more was to be said or discovered. One country, however, still remains as a fertile source of new inspiration for the student — Spain with its many marvelous examples of elaborately decorated civil buildings erected in the sixteenth century. In the limited survey of Spanish architecture that had been made previously, attention was confined chiefly to the Gothic period which preceded the Renaissance, ignoring that distinctively individual architecture called *Plateresque* founded upon the picturesque semi-Moorish stucco architecture.

In the present book the authors have made a study of this sixteenth century architecture and present to their readers a general view of the subject which should have a wide appeal. Their recent book, "Rejería of the Spanish Renaissance," treating of the beautiful iron work of the same period, gives ample proof of their sympathetic appreciation of the style and their ability to transmit its beauty through the medium of text and illustrations to their readers.

The text presents a brief historical sketch of the development of the style in Spain, biographical matter concerning its chief exponents, and a discussion of the Spanish domestic plan, together with critical appreciation of the more famous

buildings. The volume was written primarily as a practical book for architects, but its story is told so interestingly and its illustrations so adequate that it will be found entertaining at any time and for any person desiring to acquaint himself with the history of the period.

CITY PLANNING PROGRESS — 1917. Compiled by the Committee on Town Planning of the American Institute of Architects. Edited by George B. Ford. 207 pages. 228 illustrations. The Journal of the American Institute of Architects. The Octagon, Washington, D. C. \$1.50 paper. \$2.00 cloth. Postage, 20 cents extra.

In its publication of "City Planning Progress in the United States, 1917," the Institute's Committee on Town Planning has brought to completion a most comprehensive digest of the subject. The data covers what has been accomplished, or is projected, in city planning in all cities of the United States of over 25,000 inhabitants, and in a few cities and towns where the population is even smaller but where the work is of special interest. The mass of material thus obtained has been so condensed and the unimportant and irrelevant matter so fully eliminated, that there is told in something less than 200 pages, clearly and interestingly, the city planning ambitions and achievements of between two and three hundred communities, accompanied by pertinent illustrations.

Its contents is furthermore of exceptional timeliness, for events happening as recently as a month before its publication are fully described. It is in all the most complete and authoritative treatment of the subject to be obtained to date and as such should meet with favor from architects and all others interested in this subject which has such an important bearing on future social conditions.

MECHANICAL EQUIPMENT OF SCHOOL BUILDINGS. By Harold L. Alt, M.E. 111 pages. 160 illustrations. Cloth. 8 by 10¾ inches. The Bruce Publishing Co., Milwaukee. Price, \$2.50.

The successful operation of the modern school building depends to such an extent upon its mechanical equipment that the problem of selecting and making provision for such equipment is one of the serious duties of the architect. In the present book there is brought together detailed consideration of heating and ventilation, toilet room and other plumbing fixtures, water systems, sewage disposal, power plant, swimming pools, electric lighting, vacuum cleaning, and fire protection. As an outgrowth of practical experience on the part of the author this book should prove a ready and useful reference in any architect's office concerned with the design of schools.





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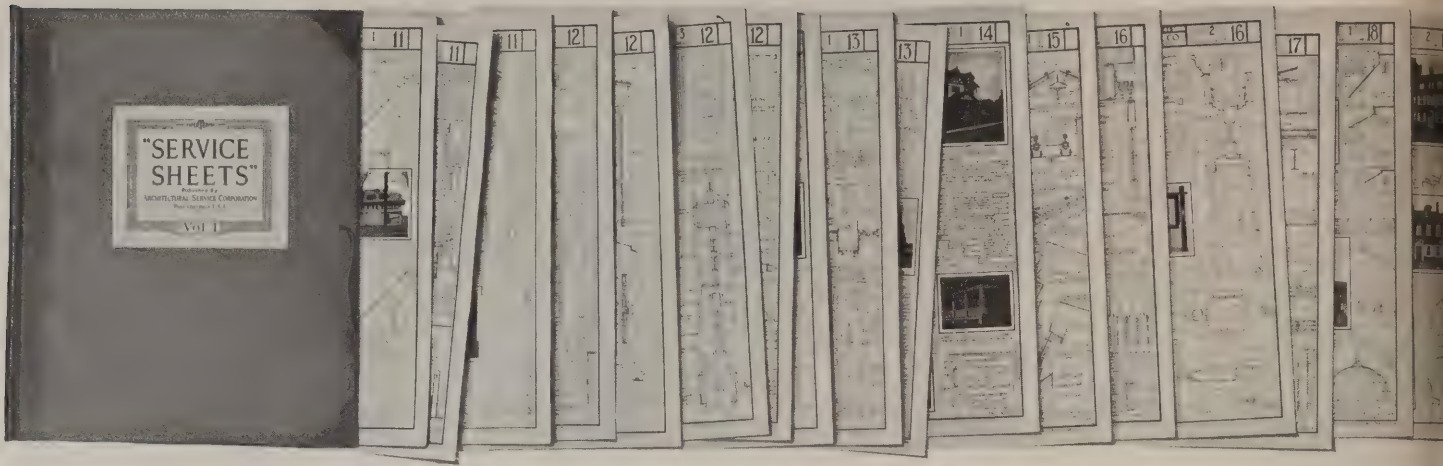
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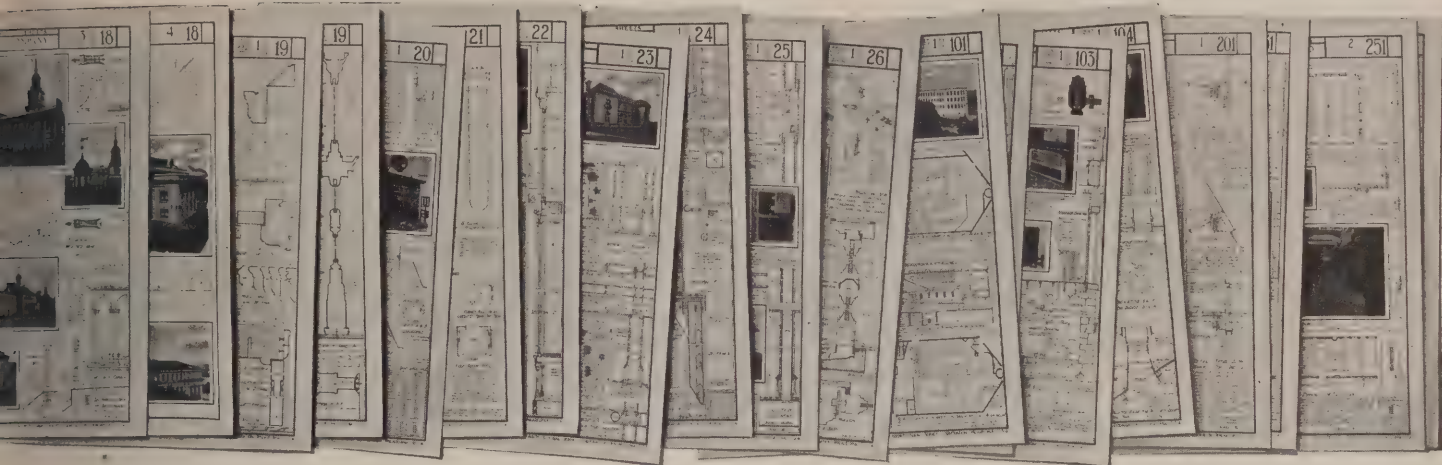
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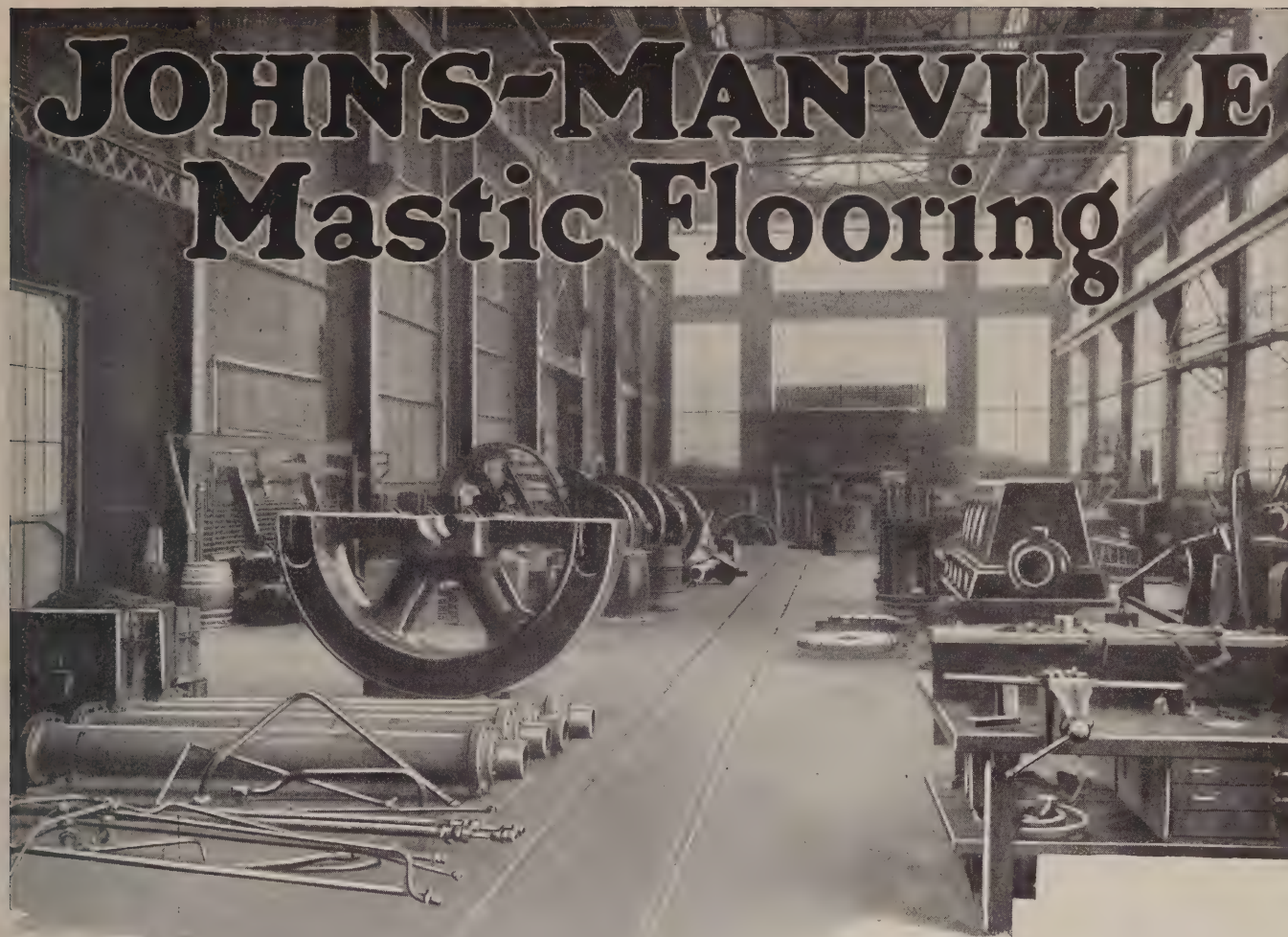
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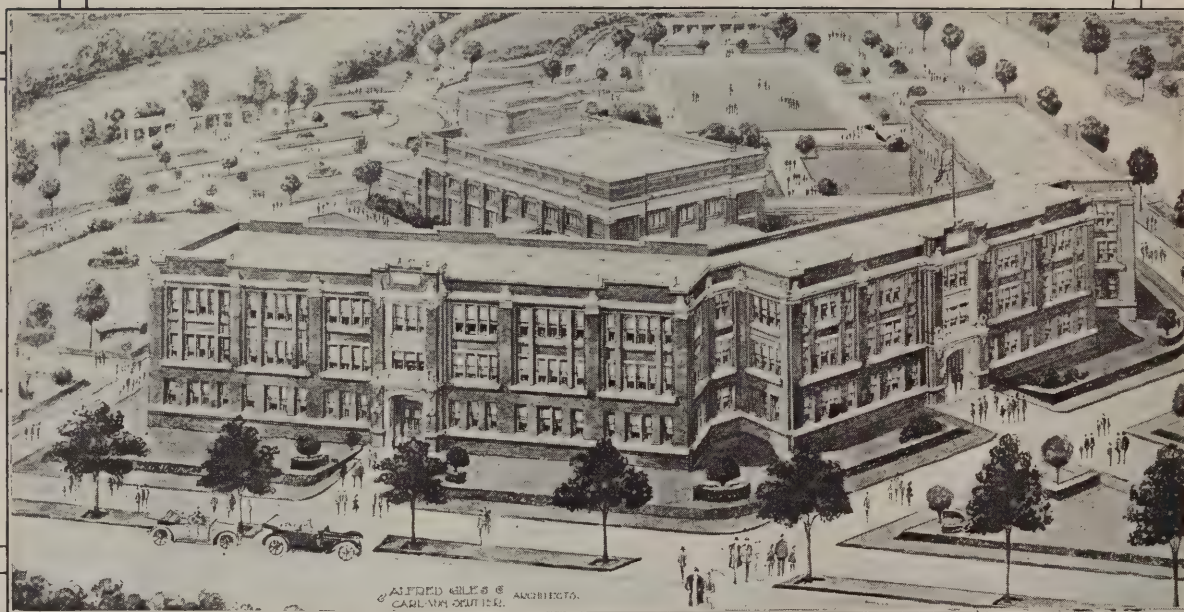
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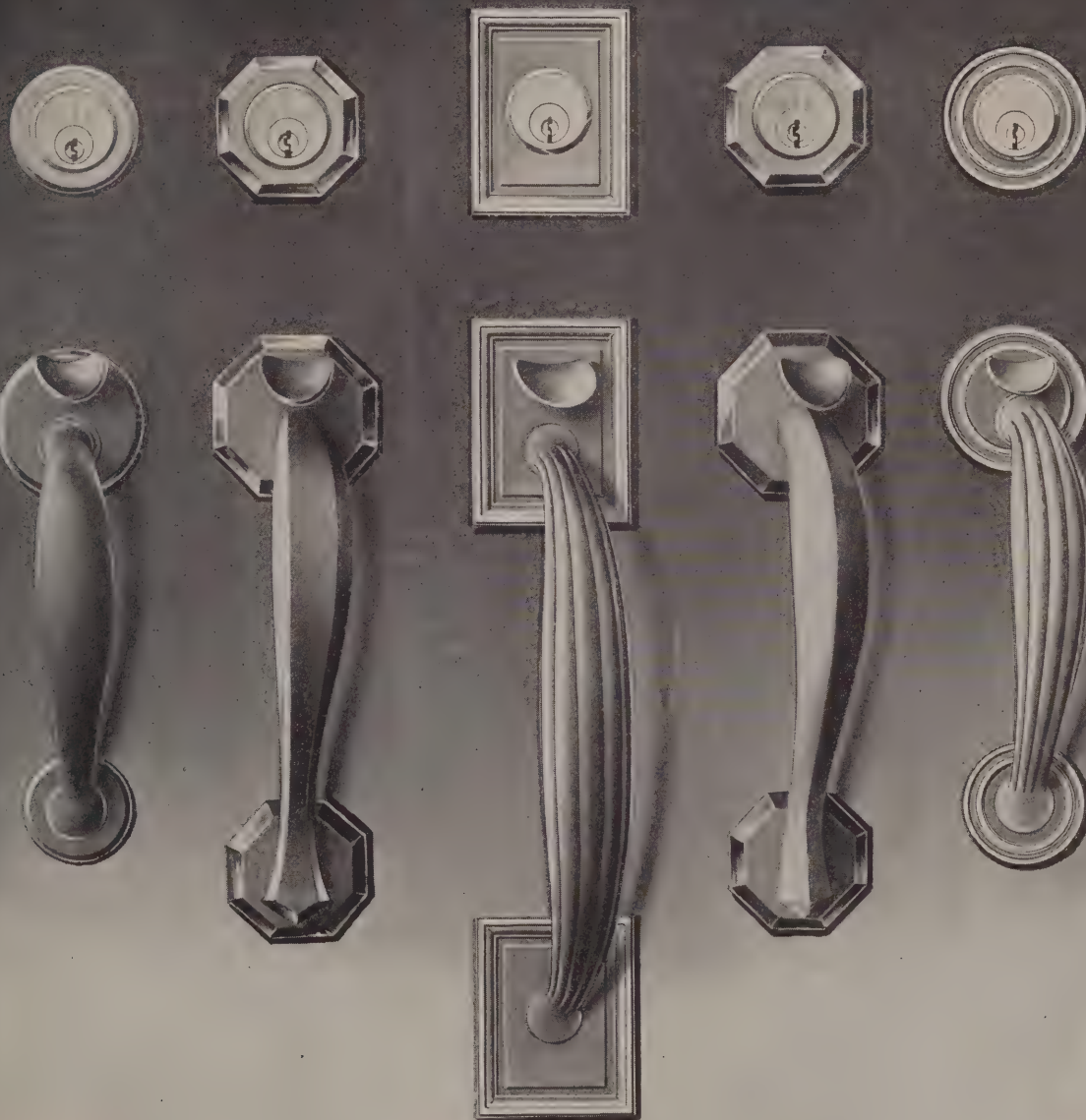
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| Corbin, P. & F. ....                          | 21       | Sandusky Cement Co., The .....                    | 49         |
| Corcoran, Inc., A. J. ....                    | 64       | Sanitary Company of America .....                 | 38, 39     |
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| Detroit Show Case Co. ....                    | 46       | Smith, Hauser & MacIsaac, Inc. ....               | 60         |
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| Dixon Crucible Co., Joseph .....              | 40       | Somerville Iron Works .....                       | 38, 39     |
| Faber, Eberhard .....                         | 80       | Sonneborn Sons, Inc., L. ....                     | 54         |
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| General Fireproofing Company, The .....       | 59       | Southern Pine Association .....                   | 87         |
| General Slate Co. ....                        | 65       | Standard Foundry Co. ....                         | 38, 39     |
| Gillis & Geoghegan .....                      | 65       | Standard Oil Cloth Co., The .....                 | 31         |
| Globe Ventilator Co. ....                     | 70       | Standard Sanitary Mfg. Co. ....                   | 36         |
| Gorton & Lidgerwood Co. ....                  | 70       | Stanley Works, The .....                          | 23         |
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| Hart Manufacturing Co., The .....             | 41       | Toch Brothers .....                               | 55         |
| Hecla Iron Works .....                        | 47       | Trenton Potteries Co., The .....                  | 36         |
| Heinicke, Inc., H. R. ....                    | 10       | Trus-Con Laboratories, The .....                  | 52         |
| Hope & Sons, Henry .....                      | 48       | Trussed Concrete Steel Co. ....                   | 27, 44     |
| Hydrated Lime Bureau .....                    | 54       | Tuttle & Bailey Mfg. Co. ....                     | 41         |
| Hydraulic-Press Brick Co. ....                | 14       | Union Foundry Co. ....                            | 38, 39     |
| Imperial Brass Mfg. Co., The .....            | 36       | United States Radiator Corp. ....                 | 69         |
| Indiana Limestone Quarrymen's Ass'n .....     | 67       | University of Pennsylvania .....                  | 80         |
| International Casement Co., Inc. ....         | 48       | Wadsworth, Howland & Co., Inc. ....               | 84         |
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| Jenkins Brothers .....                        | 68       | Wetter Mfg. Co., H. ....                          | 38, 39     |
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| Kelsey Heating Co., Inc., The .....           | 73       | Wright Wire Company .....                         | 61         |
| Kennedy, Inc., David E. ....                  | 75       | Zouri Drawn Metals Co. ....                       | 46         |
| Kepler Glass Constructions Inc .....          | 90       |                                                   |            |



# Four Garage-Door Problems Solved by Stanley Garage Hardware



No. 1



No. 2



No. 3



No. 4

## Problem Number One

The architect of this garage wanted doors that would open and close easily, lock securely and close weather-tight. His problem was solved by swinging the doors on Stanley Garage Hinges No. 1457, equipping them with Garage Bolts No. 1055 and No. 1056, and securing them against slamming with Stanley Door Holders No. 1774.

## Problem Number Two

This concrete garage has doors that are extra-heavy. Therefore they were hung on 36-inch Stanley Garage Hinges No. 1458, which will support the heaviest garage doors made, swinging them smoothly and without sagging.

## Problem Number Three

The owner preferred curved-top doors, with windows so placed that strap hinges could not be applied. So the doors were hung with ball-bearing Stanley Garage Butts No. 252, three butts to a door. They are also equipped with Latches No. 1264 and Door Holders No. 1774.

## Problem Number Four

When planning this garage, the owner wanted to be able to open all three doorways at once. And, since the garage might at times be crowded, the doors must take up no inside space. Accordingly, the doors were swung out on Stanley Garage Hinges No. 1457. Door Holders No. 1774 keep them from slamming.

*Stanley Garage Hardware meets every requirement of the most exacting garage builder. It is carried in stock by your hardware dealers. See Sweet's or send for a Stanley Garage Hardware Catalogue.*

# Stanley Works

New Britain,

Conn., U.S.A.

New York: 100 Lafayette St.

Chicago: 73 East Lake St.

# Selected List of Manufacturers' Publications

FOR THE SERVICE OF ARCHITECTS, ENGINEERS, AND CONTRACTORS

The publications listed in these columns are the most important of those issued by manufacturers represented in the advertising pages of THE ARCHITECTURAL FORUM. They may be had upon direct application to the manufacturers.

## ARCH CONSTRUCTION, TIMBREL TILE

**Guastavino Co., R.**, Fuller Building, New York, N. Y.  
Portfolio. 10½ x 13½ in. Plates.

## BRICK

**American Enameled Brick and Tile Co.**, 52 Vanderbilt Avenue, New York.  
Enameled Brick. Catalog. 6 x 9¼ in. 25 pp. Color plates.

**Claycraft Brick Co.**, 907 Hartman Building, Columbus, Ohio.  
Booklet. 6 x 9 in. 39 pp. Plates showing examples of work.

**Hydraulic-Press Brick Co.**, St. Louis.  
Bonds and Mortars in the Wall of Brick. Treatise on brick design. 8½ x 11½ in. 27 pp.  
Brick Scales and Tables. Fifteen scales for vertical and horizontal measurements, with explanatory booklet and tables. 8 x 10 in. 32 pp.  
Moulded and Ornamental Brick. Catalog. 4½ x 6½ in. 140 pp.  
The Hy-tex House of Moderate Cost. Booklet. 8 x 10½ in. 100 pp. 80 sketch plans and elevations.  
The Brick Church and Parish House. Book of designs with floor plans from drawings submitted in competition. 10½ x 13½ in. 80 pp.

**Sayre & Fisher Co.**, 261 Broadway, New York.  
Brick — Enameled and Front. Catalog. 6 x 9 in. 24 pp. Color plates.

**Western Brick Co.**, Danville, Ill.  
Where Western Face Brick Were Used in 1914 and 1915. Booklet. 4½ x 6 in. 31 pp.

## CEMENT, PORTLAND

**Atlas Portland Cement Company, The**, 30 Broad Street, New York.  
Handbook and Treatise. Concrete in Factory Construction. 6½ x 8½ in. 250 pp.  
Early Stucco Houses, with modern stucco specifications. Booklet. 8½ x 11 in. 24 pp.  
Choosing the Garage, describing actual construction. Booklet. 8 x 10½ in. 26 pp.  
Commercial Garages, with construction notes and architectural treatment. Booklet. 8 x 10½ in. 12 pp.  
Color Tones in Stucco. Booklet with colored plates. 8½ x 11 in. 24 pp.  
Building a Bungalow. Booklet. 8½ x 11 in. 18 pp. 4 color plates.

**Lehigh Portland Cement Co., The**, Allentown, Pa.  
Forty-one Concrete Reasons. Booklet. 6 x 9 in. 34 pp.  
Cement Facts. Booklet. 5½ x 6¾ in. 18 pp.  
The Expense-Proof Farm. Booklet. 6 x 9 in. 100 pp.  
Lehigh Portland Cement. Illustrated. Booklet. 8½ x 12½ in. 42 pp.

**Sandusky Cement Co., The**, Dept. S., Engineers Building, Cleveland, Ohio.  
Medusa White Portland Cement. Booklet. 8½ x 11 in. 52 pp.  
Medusa Waterproofed White Portland Cement. Booklet. 6 x 9 in. 20 pp.  
Medusa Waterproofed Gray Portland Cement. Booklet. 6 x 9 in. 20 pp.

## CHIMNEYS

**Heinicke, Inc., H. R.**, 147 Fourth Avenue, New York.  
Chimneys. Bulletin. Methods of construction.

## CONDUIT

**National Metal Molding Co.**, 1113 Fulton Building, Pittsburgh.  
Handbook on National Metal Molding. Complete details and installation instructions. 4½ x 6 in. 96 pp.  
Report of Tests and Complete Data on Sheraduct Sherardized Rigid Steel Conduit. Treatise. 6 x 9 in. 31 pp.

## CONSTRUCTION, FIREPROOF

**General Fireproofing Co., The**, Youngstown, Ohio.  
Fireproofing Handbook. 6 x 9 in. 112 pp.

## CONVEYORS, GRAVITY

**Otis Elevator Company**, Eleventh Avenue and 26th Street, New York.  
Otis Gravity Conveyors. Catalog. 6 x 9 in. 56 pp.

## DOORS, WINDOWS, AND TRIM, METAL

**Dahlstrom Metallic Door Co.**, 88 Blackstone Avenue, Jamestown, N. Y.  
Safety First for Schools. Booklet regarding fireproof equipment for schools. 3¾ x 8½ in. 12 pp.  
Safety First for Hospitals. Booklet regarding fireproof equipment for hospitals. 3¾ x 8½ in. 16 pp.  
Buildings as They Should Be. Booklet. 7½ x 10½ in. 44 pp.  
The Finishing Touch in Fireproofing Your Building. Booklet. 3¾ x 8½ in. 20 pp.

**Detroit Steel Products Co.**, 2717 East Grand Boulevard, Detroit, Mich.  
The Fenestra Line. Catalog. 8½ x 11 in. 15 sections. Blue prints.

**Lupton's Sons Co., David**, Witte and Tulip Streets, Philadelphia, Pa.  
Lupton Service and Products. No. 9. Descriptive catalog with drawings and data for specifications. 8½ x 11 in. 100 pp. and cover.

**Merchant & Evans Co.**, Philadelphia.  
Red Book. Catalog. 5½ x 8½ in. 190 pp.

**Trussed Concrete Steel Co.**, Dept. 57, Youngstown, Ohio.  
United Steel Sash. Catalog. Details and specifications. 8½ x 11 in. 128 pp.

## DUMBWAITERS

**Sedgwick Machine Works**, 182 Liberty Street, New York.  
Dumbwaiters and Elevators in Modern Architectural Practice. Booklet. 4½ x 8½ in. 15 pp.

## ELECTRICAL EQUIPMENT

**Hart & Hegeman Mfg. Co., The**, Hartford, Conn.  
Catalog O. H & H Switches and Paiste wiring material. 9 x 10½ in. 106 pp.

**Hart Mfg. Co.**, Hartford, Conn.  
"Diamond H" Switches and Receptacles. Descriptive booklet. 4 x 8½ in. 24 pp.

## ELEVATORS

**Otis Elevator Company**, Eleventh Avenue and 26th Street, New York.

Otis Electric Traction Elevators. Bulletin. 6 x 9 in. 28 pp.  
Otis Residence Elevators. Bulletin. 6 x 9 in. 16 pp.

**Sedgwick Machine Works**, 182 Liberty Street, New York.  
Selecting an Invalid Elevator. Booklet. 4½ x 8½ in. 8 pp.

## ESCALATORS

**Otis Elevator Company**, Eleventh Avenue and 26th Street, New York.

Otis Escalators. Bulletin. 6 x 9 in. 36 pp.

## FAIENCE, ARCHITECTURAL

**Rookwood Pottery Co.**, Cincinnati.  
Faience Catalog with portfolio of plates. 9½ x 12½ in. 64 pp.

## FLOORING

**Armstrong Cork & Insulation Co.**, 132 24th St., Pittsburgh.  
Linotile Floors. Book. 6 x 9 in. 32 pp.

**Master Builders Company, The**, Cleveland, Ohio.  
Master Builders Standard Specifications. 4 x 8 in. 8 pp.  
Sanisael Liquid Concrete Floor Hardener. Descriptive booklet and directions. 3½ x 6½ in. 8 pp.

**Sonneborn Sons, Inc., L.**, Dept. 4, 264 Pearl Street, New York.  
Lapidolith Specifications. Booklet. 8½ x 10½ in.  
Scientific Investigation of the Action of Lapidolith on Concrete by Prof. R. J. Colony. Booklet.

**Toch Brothers**, Dept. 97, 320 Fifth Avenue, New York.  
"R. I. W." Cement Filler and Cement Floor Paint. Booklet. 5½ x 8 in. 28 pp.

## GARDEN POTTERY — See Pottery, Garden.

## GLASS CONSTRUCTION

**Berger Manufacturing Co.**, Canton, Ohio.  
Berger's Radiant Sidewalk Lights. Catalog T. F. 8½ x 11 in. 42 pp.

**Keppeler Glass Constructions Inc.**, Architects Building, 101 Park Avenue, New York.  
Bulletin No. 126. 8½ x 11½ in. 12 pp.  
Bulletin No. 202. 9 x 12 in. 6 pp.  
Bulletin No. 203. 9 x 12 in. 4 pp.  
Bulletin No. 205. 9 x 12 in. 6 pp.



# Raymond Concrete Piles



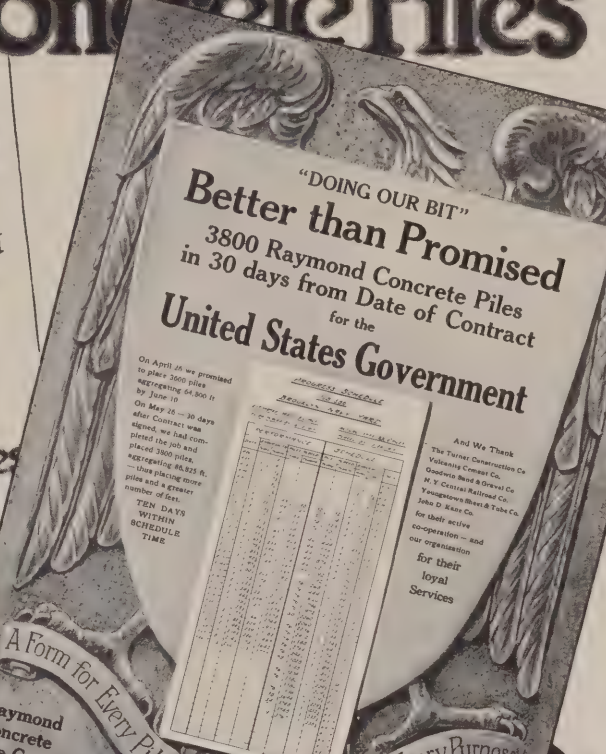
**Speeding Up**  
for the  
**United States Government**  
**"Doing Our Bit"**  
On April 26, 1917, we agreed to place  
**3,600**  
**Raymond Concrete Piles**  
at the Brooklyn Navy Yard within  
**46 Calendar Days**  
or by June 10, 1917

These firms who will help us make good:  
Turner Construction Co. Genl. Con-  
Vulcanite Cement Co. Cement Co.  
Goodwin Sand & Gravel Co. Sand and  
New York Central Railroad Co. Transpo-  
York Sheet & Tube Co. Sheet S-  
Kane Co. Concr-  
A LOYAL ORGANIZATION - O-  
A Form for Every Pile A Pile for

**Raymond Concrete Pile Co.**  
New York: 140 Cedar Street  
Chicago: 111 West Monroe Street  
Raymond Concrete Pile Co., Ltd., Montreal, Canada  
J. WRIGHT, Vice-Pres. - in Charge of New York



From ARCHITECTURAL FORUM, May



**"DOING OUR BIT"**  
**Better than Promised**  
3,800 Raymond Concrete Piles  
in 30 days from Date of Contract  
for the  
**United States Government**

On April 26 we promised to place 3,600 piles by June 10. On May 18 - 30 days after Contract was signed, we had completed the job and placed 3,800 piles, representing \$5,525 A. - Thus placing more piles and a greater number of feet, **TEN DAYS WITHIN SCHEDULE TIME**

| DATE   | QUANTITY | FEET    | REMARKS   |
|--------|----------|---------|-----------|
| APR 26 | 3,600    | 108,000 | ORDERED   |
| MAY 18 | 3,800    | 114,000 | COMPLETED |
| TOTAL  | 3,800    | 114,000 |           |

And We Thank  
The Turner Construction Co.  
Goodwin Sand & Gravel Co.  
N. Y. Central Railroad Co.  
Youngstown Sheet & Tube Co.  
John D. Kane Co.  
for their active  
co-operation - and  
our organization  
for their  
loyal  
Services

**A Form for Every Pile**  
**Raymond Concrete Pile Company**

**A Pile for Every Purpose**  
New York  
140 Cedar Street  
Chicago: 111 West Monroe Street  
Raymond Concrete Pile Co., Ltd.  
Montreal, Canada  
J. WRIGHT, Vice-Pres. - in Charge of New York

From ARCHITECTURAL FORUM, June

## Promise vs. Performance

In our May advertisement we explained our promise to place  
**3,600**

## Raymond Concrete Piles

at the Brooklyn Navy Yard for the Government within 46 calendar days.

The June issue tells of our *bettering* our promise by placing 3,800 piles on the job *within 30 days from date of contract*, April 26, 1917.

What we do for the Government, we do for the individual. We pursue our work with careful speed. Co-operation upon the part of firms with whom we deal makes for efficiency in organization. Efficiency enables us to keep more than ahead of our promises.

## Raymond Concrete Pile Co.

New York: 140 Cedar Street

Chicago: 111 West Monroe Street

Raymond Concrete Pile Co., Ltd., Montreal, Canada



# SELECTED LIST OF MANUFACTURERS' PUBLICATIONS — *Continued from page 24*

## GLASS CONSTRUCTION — Continued

**Lord & Burnham Co.,** 42d Street Building, New York.  
Some Greenhouses We Have Built. Illustrations. Completed work. Catalog. 9½ x 12½ in. 98 pp.

## HARDWARE

**Columbian Hardware Co., The,** Cleveland, Ohio.  
Making It Easier to Buy Columbian Sash Pulleys. Folder. 3¼ x 8¼ in. 14 pp.

**Corbin, P. & F.,** New Britain, Conn.  
Colonial Hardware. Booklet. 5 x 7 in. 32 pp.  
Corbin Door Checks. Catalog. 5 x 7 in. 40 pp.  
Corbin Door Knockers. Booklet. 5 x 7 in. 24 pp.  
General Catalog. 10½ x 13 in. 1200 pp.

**Imperial Brass Mfg. Co.,** 1208 West Harrison Street, Chicago.  
Hardware Catalog No. 105. 6 x 9 in. 36 pp.

**Reliance Ball Bearing Door Hanger Co.,** Grand Central Terminal Building, New York.  
Door Hangers, etc. Catalog. 8 x 9½ in. 32 pp.

**Russell & Erwin Mfg. Co.,** New Britain, Conn.  
General Catalog. 9 x 12 in. 1250 pp.  
Russwin Period Design Booklet. 6 x 8 in. 72 pp.  
Russwin Fire Exit Bolt Catalog. 6 x 9 in. 46 pp.  
Russwin Monograph (28 subjects). 3½ x 6 in. 6 pp.

**Stanley Works, The,** New Britain, Conn.  
Wrought Hardware. Catalog. Describing wrought steel hinges, butts and door bolts. 6½ x 10 in. 260 pp.  
Stanley's Wrought Steel Garage Door Hardware. Booklet. 3½ x 6½ in. 8 pp.  
Properly Hung Doors. Booklet. 5 x 7½ in. 16 pp.  
"Stanley" Sherardizing. Descriptive booklet. 3½ x 6¼ in. 4 pp.

**Vonnegut Hardware Company,** Indianapolis.  
Von Duprin Self-Releasing Fire Exit Device. Catalog 12F.

## HEATING EQUIPMENT

**American Blower Co.,** Detroit, Mich.  
"A B C" Heaters. Bulletin. 8½ x 11 in. 24 pp.  
Vento Cast-Iron Hot-Blast Heater. Bulletin. 8½ x 11 in. 44 pp.

**American Radiator Co.,** 816 S. Michigan Avenue, Chicago.  
The Ideal Fitter. Handbook with specification data. 6½ x 3¼ in. 336 pp.

**Boynston Furnace Co., The,** 106 West 37th Street, New York.  
Square Pot Heaters. Catalog. 7 x 9¼ in. 60 pp.

**Crane Co.,** 836 South Michigan Avenue, Chicago.  
Steam Goods. Complete pocket catalog. 4½ x 6 in. 620 pp.

**Fulton Company, The,** 141 Broadway, New York.  
Catalog D. 7 x 10¼ in. 22 pp.

**Gorton & Lidgerwood Co.,** 96 Liberty Street, New York.  
Modern House Heating. Catalog No. 88. 4¼ x 7 in. 32 pp.

**Jenkins Bros.,** 80 White Street, New York.  
Catalog and Price List. 4 x 6¼ in. 256 pp.

**Kelsey Heating Co., The,** 238 James Street, Syracuse, N. Y.  
Architects' Portfolio. 12 plates showing plans, heating, specifications, and layouts. 8½ x 11 in.  
Kelsey System of Heating and Ventilating. Booklet. 36 pp.  
Kelsey Warm Air Generators. Booklet. 32 pp.

**Lord & Burnham Co.,** 42d Street Building, New York.  
Burnham Boilers. Catalog No. 56. 4 x 10 in. 19 pp.

**National Tube Company,** Frick Building, Pittsburgh, Pa.  
Catalog J. Descriptive of fittings and valves. 5½ x 7¾ in. 488 pp.  
The Whole Kewanee Family. Booklet. Illustrations. 5 x 8 in. 72 pp.

**Sturtevant Co., B. F.,** Dept. B, Hyde Park, Boston, Mass.  
Heating and Ventilation. Treatise. 6½ x 9 in. 325 pp.

**United States Radiator Corporation,** Detroit.  
A Modern "House Warming." Booklet. 6 x 9 in. 30 pp.  
The "Complete Line." Technical data. Catalog. 4¼ x 7¼ in. 270 pp.

## HOISTS

**Gillis & Geoghegan,** 544 West Broadway, New York.  
The G. & G. Telescopic Hoist (all models). Booklet A. 8½ x 11 in. 16 pp.

## HOLLOW TILE — See Tile, Hollow

## INSULATION

**Armstrong Cork & Insulation Co.,** 132 24th Street, Pittsburgh.  
Nonpareil Corkboard Insulation. Scientific treatise. 6 x 9 in. 130 pp.  
Nonpareil High Pressure Covering. Scientific treatise. 6 x 9 in. 84 pp.

**Cabot, Inc., Samuel,** 141 Milk Street, Boston.  
Cabot's Quilt. Booklet. 6 x 8½ in. 32 pp.

**Johns-Manville Co., H. W.,** Madison Avenue, New York.  
J-M Keystone Hair Insulator. Booklet. 6 x 9 in. 16 pp.  
How to Reduce Coal Bills 25 Per Cent. (J-M Asbestocel Pipe Covering.) Booklet. 3½ x 6 in. 8 pp.

## JOISTS AND STUDS, PRESSED STEEL

**Berger Manufacturing Co.,** Canton, Ohio.  
Metal Lumber. Series of technical bulletins 12F especially prepared for architects. 8½ x 11 in. 32 pp.  
Riblex, Bulletin No. 14. 8½ x 11 in. 4 pp.

**Trussed Concrete Steel Co.,** Pressed Steel Dept., Youngstown, Ohio.  
Kahn Pressed Steel Construction. Catalog. Complete details and specifications. 8½ x 11 in. 32 pp.

## LATH, METAL

**Berger Manufacturing Co.,** Canton, Ohio.  
Berger's Expanded Metal Lath. Booklet. 3½ x 6 in. 44 pp. Supplement. 24 pp.

**General Fireproofing Co., The,** Youngstown, Ohio.  
Herringbone Rigid Metal Lath. A complete catalog on Herringbone Metal Lath. 6 x 9 in. 32 pp.

**North Western Expanded Metal Co.,** 934 Old Colony Building, Chicago, Ill.  
Kno-Burn Expanded Metal Lath. Treatise on metal lath, with details and specifications. 6 x 9 in. 52 pp.  
"Chanelath" Handbook. Treatise on ribbed metal lath details and specifications of its application to reinforced concrete construction and for plastering. 6 x 9 in. 64 pp.

**Trussed Concrete Steel Co.,** Youngstown, Ohio.  
Hy-Rib Handbook. Specifications. 5½ x 7¾ in. 142 pp.

**Wright Wire Co.,** Worcester, Mass.  
General Catalog. Description and full particulars of wire lath, wire fencing, ornamental iron work, elevator cabs, railings, partitions, and grille work. 6 x 9 in. 224 pp.  
Wire Lath. Booklet L. Shows where Wright wire lath has been used. 3½ x 6½ in. 16 pp.

## LIGHTING EQUIPMENT

**Ivanhoe-Regent Works of General Electric Co.,** Cleveland.  
Lighting Handbook. Semi-technical on general lighting practice. 4 x 7 in. 94 pp.  
Semi-Indirect Lighting Bowls. Catalog No. 108. 8 x 10½ in. 48 pp.  
Holograph Reflectors and Fittings. Catalog No. 80. 4 x 7 in. 50 pp.  
Ivanhoe Reflectors and Fittings. Catalog No. 303. 4 x 7 in. 50 pp.

**Luminous Unit Co.,** St. Louis.  
Brascolite — The Modern Semi-Indirect Lighting System. Catalog No. 5. 8¼ x 10¼ in. 24 pp.  
Brascolite Data. Scientific data sheets. Portfolio 9 x 11½ in. Blue prints.  
Aglites. Folder catalog. All-glass lighting fixtures. 5¼ x 8 in. 8 pp.

**McFaddin & Co., H. G.,** 42 Warren Street, New York.  
Emeralite. Booklet. Colored plates. 3½ x 6¼ in. 32 pp.

**National X-Ray Reflector Co.,** 243 West Jackson Boulevard, Chicago.  
Engineering Data Book. Technical handbook. 6 x 9 in. 125 pp.  
Illumination from Concealed Sources — How to Plan and Specify Indirect Lighting. Scientific treatise. 12 x 15 in. 52 pp. 36 detail drawings.

**St. Louis Brass Mfg. Co.,** St. Louis.  
"Concealite" Catalog A. Lighting fixtures for auditoriums, banks, show windows, etc., from concealed or semi-concealed sources. 7½ x 10½ in. 20 pp.

## METAL LATH — See Lath, Metal.

## METAL TRIM — See Doors, Windows, and Trim, Metal.

## METAL WORK, ORNAMENTAL

**Gorham Co. Architectural Bronze, The,** Fifth Avenue and 36th Street, New York.  
Architectural Bronze Work. Portfolio. 9¼ x 12¼ in. Plates. Architectural Mouldings and Rosettes. Catalog. 9¼ x 12½ in. 16 plates.

**Polachek Bronze and Iron Co., John,** 480-494 Hancock Street, Long Island City, N. Y.  
Distinctive Metal Work. Booklet. 8½ x 11 in. 6 pp.

**Smyser-Royer Company,** 1225 Race Street, Philadelphia, Pa.  
Portfolio illustrating standards and other lighting fixtures. 4½ x 10½ in. 175 pp. thus far.

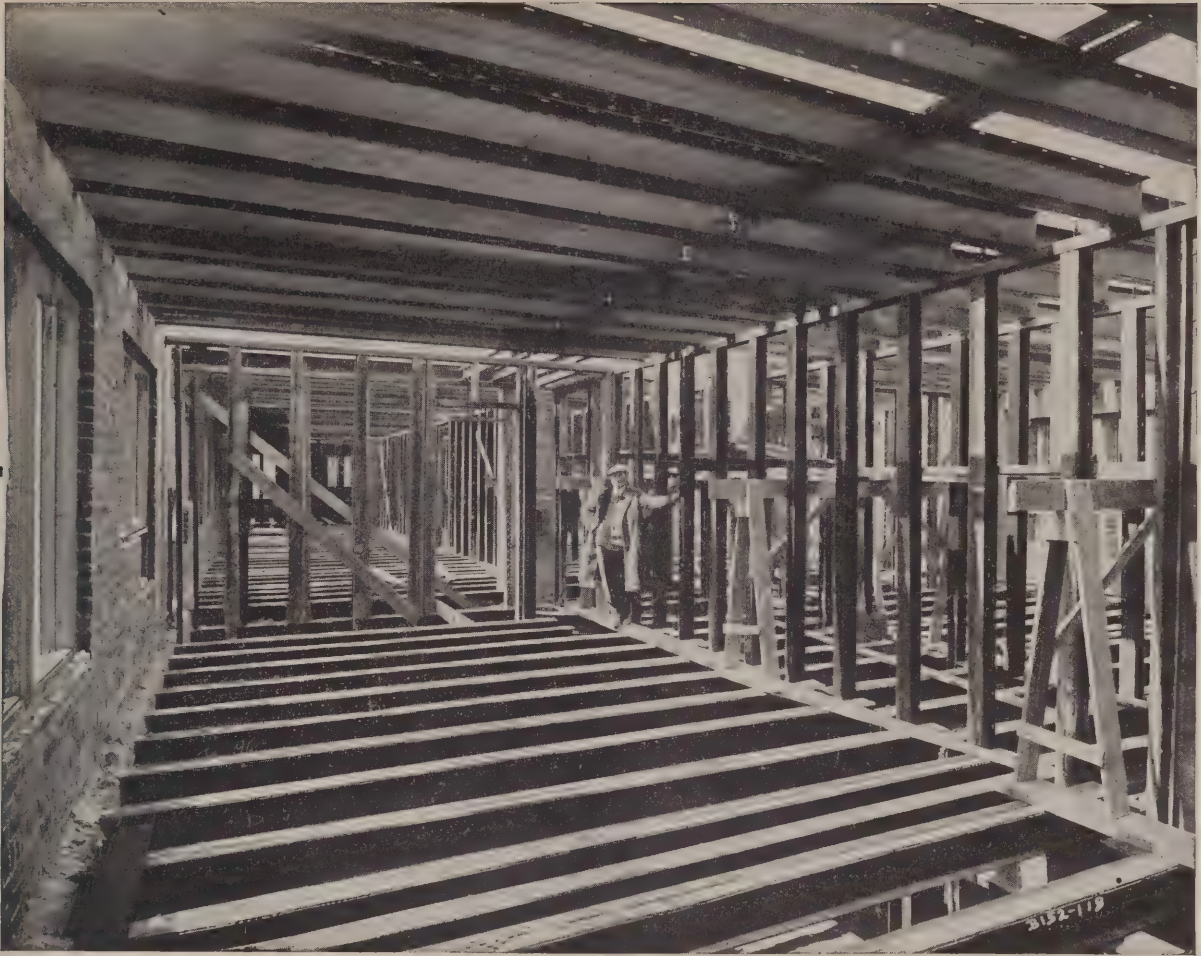
**Tuttle & Bailey Mfg. Co.,** 52 Vanderbilt Avenue, New York.  
Special Designs of Grilles and Screens in Bronze, Brass, Iron, and Steel. Catalog No. 66A. 6½ x 10 in. 40 pp.

**Winslow Bros. Company,** 4600-4700 West Harrison Street, Chicago, P. O. Box No. 803.  
Ornamental Iron and Bronze. Illustrations of completed work. 8½ x 11 in. 300 pp.

## OFFICE SUPPLIES, ARCHITECTS'

**Dixon Crucible Co., Joseph,** Dept. 224-J, Jersey City, N. J.  
"Eldorado" — The Master Drawing Pencil. Booklet.





Pressed Steel Joists and Studs before applying Hy-Rib Metal Lath. Nagel Apartment, Detroit, Michigan  
 Geo. W. Graves, Architect Ragowski Bros. & Wedda, Contractors

## Interior Construction of Kahn Pressed Steel

These all-steel joists and studs that cannot burn or rot, that do not shrink or sag, are used with Hy-Rib Metal Lath to provide a fire-resisting construction which is quickly erected without forms or special equipment. All members are shop-made, avoiding all cutting or fitting at the building site. No bolts nor rivets are required. To attach Metal Lath merely hammer down the prongs in the members. Kahn Pressed Steel Construction prevents depreciation, vermin loss and plaster cracking. It assures economy and speedy erection.

Kahn Pressed Steel is being used in buildings of all types, large and small — apartments, stores, public buildings, factories, etc. Leading architects and contractors endorse it.

*Write for catalogs, estimates, suggestions*

**Pressed Steel Department**

**Trussed Concrete Steel Company**

**Youngstown, Ohio**

**Representatives in Principal Cities**

# SELECTED LIST OF MANUFACTURERS' PUBLICATIONS — *Continued from page 26*

## ORNAMENTS, PLASTIC

**Jacobson & Company**, 241 East 44th Street, New York.  
Architectural and Decorative Ornaments. Catalog. 9½ x 12½ in. 192 pp.

## PAINTS, VARNISHES, AND WOOD FINISHES

**Arco Company, The**, Wise Building, Cleveland, Ohio.<sup>†</sup>  
Arco Specifications. Loose leaf specifications for full Arco line. 22 specifications. 8½ x 11 in.

**Berry Bros.**, Detroit, Mich.  
Natural Woods and How to Finish Them. Complete varnish specifications. 4¾ x 6½ in. 94 pp.  
Luxberry Cement Coating. Color card. 3½ x 8½ in. 3 pp.

**Boston Varnish Co.**, Everett Station, Boston.  
Kyanize Enamel. Specifications. Booklet. 5 x 7 in. 20 pp.  
Kyanize White Enamel. Directions. Circular. 3½ x 6 in. 8 pp.  
Price List of Varnishes and Enamels. 3½ x 6 in. 24 pp.

**Dixon Crucible Co., Joseph**, Dept. 224-J, Jersey City, N. J.  
Philosophy of Protective Paint. 3½ x 6¼ in. 24 pp.

**Lowe Bros. Co., The**, 101 Park Ave., New York and Dayton.  
Architects' Mellotone Handbook. 3 x 8 in. 27 pp. Color plates.  
High Standard Paint and Varnish Specifications. Handbook. 4½ x 7 in. 70 pp.  
Paint and Painting. Directions and data. 5 x 9 in. 30 pp.  
Varnish and Varnishing. Treatise. 5 x 9 in. 44 pp.

**Murphy Varnish Co.**, Newark, N. J.  
The House that Found Itself. Booklet. 6¼ x 9¼ in. 28 pp.  
Harmony in Interior Decoration. Booklet. 5¼ x 8¼ in. 56 pp.  
Dealer's Descriptive List. Booklet. 4½ x 6½ in. 28 pp.  
Beautiful Boats and How to Care for Them. Booklet. 5¼ x 8¼ in. 50 pp.

**O'Brien Varnish Company, The**, Washington Street, South Bend, Ind.  
Specification Data. Information concerning O'Brien line of varnishes and interior finishes. 8½ x 11 in.

**Smith & Co., Edward**, P. O. Box 1780 New York.  
Architects' Handbook. Specifications. 5 x 7½ in. 24 pp.

**Wadsworth, Howland Co., Inc.**, 139 Federal Street, Boston.  
Bay State Finishes. Stains, and Varnishes. Catalog. Color cards.

## PARTITIONS, FOLDING AND ROLLING

**Folding Partition Co., Inc.**, 200 Broadway, New York, N. Y.  
Sectionfold Partitions. Catalog with detail sheet. 20 x 27 in.

## PILES

**MacArthur Concrete Pile and Foundation Co.**, 120 Broadway, New York.  
The Pedestal Pile. Catalog. Engineering data. 6 x 9 in. 64 pp.

**Raymond Concrete Pipe Co.**, 140 Cedar Street, New York.  
Raymond Concrete Piles. Catalog. 8½ x 11¼ in. 56 pp.

## PIPE

**Byers Company, A. M.**, 235 Water Street, Pittsburgh.  
Bulletin No. 26. Tables and Specifications. Bulletin (2d Edition, Enlarged and Revised). 8½ x 11 in. 24 pp.  
Bulletin No. 27. The experience of practical men. 8½ x 11 in. 40 pp.  
Selection of Pipe for Modern Buildings. Booklet of special interest to architects. 4 x 6 in.  
On the Trail of Byers Pipe. Booklet. 4 x 6¼ in. 46 pp.

**Central Foundry Company**, 90 West Street, New York.  
Soil Pipe and Fittings. Catalog. 4 x 7½ in. 88 pp.  
The Lynn Drain Trap. A leaflet containing description.  
Combination Vent, Revent, and Drainage Fittings. Catalog. 4¼ x 6¼ in. 183 pp.

**National Tube Company**, Frick Building, Pittsburgh, Pa.  
Shelby Mechanical Tubing. Booklet. 3½ x 6 in. 35 pp.  
Boiler Tubes List No. 6, 1916. Booklet. 4 x 6½ in. 16 pp.  
Pipe List No. 5, 1913. Booklet. 4 x 6½ in. 20 pp.  
National Bulletins, Nos. 1 to 27, inclusive. 8½ x 11 in.  
National Pipe Standards. Booklet. Appendix to 1913 edition. Tables and useful information pertaining to tubular goods. 4 x 6½ in. 400 pp.

## PLASTER

**Hydrated Lime Bureau**, 1506 Arrott Bldg., Pittsburgh.  
Standard Specifications for Hydrated Lime Plastering. Pamphlet E. 6¼ x 9¼ in. 20 pp.  
Better Plastering and Better Acoustics. Bound booklet. 6¼ x 9¼ in. 40 pp.

**Kelley Island Lime & Transport Co.**, Cleveland, Ohio.  
Specifications for Hydrated Lime Plastering. Booklet. 6 x 9 in. 20 pp.  
Hydrated Lime Plaster. Booklet. 6¼ x 9¼ in. 12 pp.  
Tiger Tales. Booklet. 4 x 8 in. 12 pp.  
The Perfect Finishing Lime. Booklet. 4½ x 7¼ in. 34 pp.

## PLUMBING EQUIPMENT

**Crane Co.**, 836 South Michigan Avenue, Chicago.  
Catalog. 9 x 12 in. 834 pp.

**Imperial Brass Mfg. Co.**, 1208 West Harrison Street, Chicago.  
Shower Mixer. Booklet. 3 x 8 in. 16 pp.

**Kohler Co.**, Kohler, Wis.  
Kohler Catalog. Cloth bound. 9½ x 11¼ in. 164 pp.

**Standard Sanitary Mfg. Co.**, Dept. 4, Pittsburgh, Pa.  
"Standard" Catalog. General catalog of "Standard" line. 9 x 12 in. 676 pp.  
"Standard" Plumbing Fixtures for the Home. Catalog.  
Factory Sanitation. Catalog and scientific treatise. 9 x 12 in. 36 pp.

**Trenton Potteries Co.**, Trenton, N. J.  
Bathrooms of Character. Booklet. 4 x 7¼ in. 48 pp.  
Sanitary Pottery. Monthly house organ. 6 x 9 in. 16 pp. Color plates.

## POTTERY, GARDEN

**Atlantic Terra Cotta Company**, 1170 Broadway, New York.  
Garden Pottery. Catalog. 9 x 12 in. 12 pp.

## PUMPS

**Goulds Manufacturing Co.**, Seneca Falls, N. Y.  
All Types of Centrifugal and Reciprocating Power Pumps. Bulletins. 20 sections. 7¼ x 10 in.  
Handy Data on Power Pumping. Bulletin 118. 7¼ x 10 in. 24 pp.

## ROOFING

**American Sheet & Tin Plate Co.**, Frick Building, Pittsburgh.  
Copper — Its Effect Upon Steel for Roofing Tin. Scientific treatise. New edition. 8½ x 11 in. 24 pp.  
Pocket Reference Book. 2½ x 4¼ in. 168 pp.

**Barrett Company, The** (formerly The Barrett Mfg. Company), 17 Battery Place, New York City.  
Barrett's Specification Roofs — 20-Year Guaranty Bond. Loose-leaf specifications with details. 8½ x 14 in.  
Foundation Waterproofing. Loose-leaf specifications. 8½ x 14 in.  
Tylike Shingles with Red or Green Crushed Slate Surface. For residences, etc. Descriptive booklet. 6 x 8 in.  
Velvex Creosote Shingle Stains. Descriptive folder showing colors on wood. 3½ x 6½ in.

**Boyle & Co., Inc., John**, 112-114 Duane Street, New York.  
Opinions of Practical Builders. Instructions for using Bayonne Roof and Deck Cloth. Book S. 3½ x 6 in. 24 pp.

**Carey Co., The Philip**, Lockland, Cincinnati.  
Architects' Book of Carey Roofing Specifications.

**Creo-Dipt Co.**, 1025 Oliver Street, North Tonawanda, N. Y.  
Book of Homes. Houses on which "Creo-dipt" shingles have been used. Booklet. 8 x 10 in. 32 pp.

**General Slate Company**, 200 Devonshire Street, Boston.  
General Slate Company — Roofing Slate. Booklet. 6 x 9 in. 16 pp.

**Johns-Manville Co., H. W.**, Madison Avenue, New York.  
J-M Corrugated Asbestos Roofing. Catalog. 6 x 9 in. 32 pp.  
J-M Transite Asbestos Shingles. Catalog. 6 x 9 in. 32 pp.

**Ludowici-Celadon Company**, 104 South Michigan Avenue, Chicago.  
Roofing Tile. A detailed reference for architects. 9¼ x 13½ in. 106 pp.  
Roofing Tile Catalog. 3¼ x 9 in. 10 pp.  
The Roof Beautiful. Booklet. 6¼ x 9¼ in. 40 pp. Color plates.  
Why Tile Is Best. Booklet. 3¼ x 6¼ in. 8 pp.

**Taylor Co., N. & G.**, 300 Chestnut Street, Philadelphia.  
A Guide to Good Roofs. Booklet. 3¼ x 5½ in. 24 pp.  
Selling Arguments for Tin Roofing. Booklet. 6 x 9¼ in. 80 pp.  
"Service Sheets." Working Drawings, Construction and tables of covering capacity of tin. 16½ x 21½ in.  
Standard Specifications for Tin Roofing Work. 7½ x 9 in.

## STONE

**Indiana Limestone Quarrymen's Association**, P. O. Box 505, Bedford, Ind.  
Indiana Limestone Booklet. Vol. 4. 6 x 8¼ in. 40 pp.

## STORE FRONTS

**Detroit Show Case Co.**, 467 Fort Street West, Detroit, Mich.  
Metal Store Front Construction. Handbook. 6 x 10 in. 32 pp.  
With full size blue print details. 24 x 36 in.

**Kawneer Manufacturing Co.**, Niles, Mich.  
Architects' Portfolio of Details. 17 full size construction plates, loose leaf. 34 x 44 in. Also 17 half size construction plates, bound. 8½ x 11 in.

**Zouri Drawn Metals Co.**, 1817 East End Avenue, Chicago Heights, Ill.  
Zouri Safety Key-Set Store Front Construction. Detail sheet showing sections of construction. 9 x 11 in. 4 pp.



# SAFETY AND ECONOMY

## *The Question of Foundations*

SOONER or later engages the attention of every architect on works of magnitude. It is a fundamental question determining the ultimate success of the work. It is a question of **Safety and Economy** — of realizing maximum security at minimum cost. It is a question which the architect must decide on a basis of authoritative knowledge on all foundation types. Hence —

## The PEDESTAL PILE

The distinct and radical improvement embodied in this pile lies in the following fact — its load-carrying capacity is due not alone to its frictional adhesion to the materials surrounding it, but also to the direct bearing of its enlarged base upon the compacted materials beneath it. **The Pedestal Pile is a pile plus a pedestal**, as illustrated by the sketches at either side of these paragraphs. The greater carrying-capacity thus afforded explains **Pedestal Pile Safety**. And the fact — that a stated carrying-capacity can be secured with fewer piles or with shorter piles, explains **Pedestal Pile Economy**.

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Pittsburgh

# SELECTED LIST OF MANUFACTURERS' PUBLICATIONS — *Continued from page 28*

## STUCCO BOARD

**Bishopric Manufacturing Co., The**, 910 Este Avenue, Cincinnati, Ohio.  
The Bishopric Mastic Products. Booklet. 6 x 9½ in. 24 pp. Color plates.  
Built on the Wisdom of Ages. Booklet showing methods of using Bishopric Stucco Board. 8½ x 11 in. 48 pp.

## TELEPHONE SYSTEMS, INTERIOR

**New York Telephone Co.**, 15 Dey Street, New York.  
Intercommunicating Residence Telephone Service. Booklet. 5 x 7 in. 16 pp.

## TERRA COTTA, ARCHITECTURAL

**American Terra Cotta & Ceramic Co.**, 2010 Peoples' Gas Building, Chicago.  
Specifications for Architectural Terra Cotta and Details of Construction. 14 plates.

**Atlantic Terra Cotta Co.**, 1170 Broadway, New York.  
Atlantic Terra Cotta. Monthly publication. 9 x 12 in. 12 pp.

**Conkling-Armstrong Terra Cotta Co.**, Philadelphia.  
Ornament and Details of Construction. Catalog. 9½ x 13 in.

**Midland Terra Cotta Co.**, 1515 Lumber Exchange Building, Chicago.  
Stock Terra Cotta. Portfolio. 10 x 15 in. 60 plates.

**New Jersey Terra Cotta Co.**, Singer Building, New York.  
The Victoria Building. Booklet. 8½ x 11 in. 10 pp.

**New York Architectural Terra-Cotta Co.**, 401 Vernon Avenue, Long Island City, N. Y.  
Architectural Terra Cotta. Booklet. 8 x 8½ in. 36 pp.

**South Amboy Terra Cotta Co.**, 150 Nassau Street, New York.  
Plates of Ornamental Detail and Construction. Portfolio.

## TILE, HOLLOW

**National Fire Proofing Co.**, 592 Federal Street, Pittsburgh.  
Builders' Handbook. Details of construction. 8½ x 11 in. 34 pp. Blue prints.  
Fireproof Houses of Natco Hollow Tile. Catalog. 8½ x 11 in. 30 pp.  
Long Span Fireproof Floor Construction. Details, tables, tests. Handbook. 8½ x 11 in. 60 pp. Color plates.  
Natco on the Farm. Catalog. 5½ x 7½ in. 50 pp.

## TILE, STEEL

**General Fireproofing Co., The**, Youngstown, Ohio.  
Steel-Tile Handbook. Tables, formulas, specifications, etc., for tile floors and concrete work. 6 x 9 in. 32 pp.

**Trussed Concrete Steel Co.**, Youngstown, Ohio.  
Floretyle Construction. Booklet containing table and full information for specifying. 8½ x 11 in. 16 pp.

## VENTILATION

**American Blower Co.**, Detroit, Mich.  
American Sirocco Fans and Blowers. Bulletin. 8½ x 11 in. 52 pp.

**American Radiator Co.**, 816 So. Michigan Avenue, Chicago.  
"A B C" Steel Plate Fans. Bulletin. 8½ x 11 in. 28 pp. Ventilation by Vento Heaters. Booklet. 8 x 10½ in. 24 pp.

**Clarage Fan Co.**, Kalamazoo, Mich.  
Catalog No. 5. 6 x 9 in. 26 pp.

**Globe Ventilator Co.**, Dept. P, Troy, N. Y.  
Booklet. 4 x 9 in. 36 pp.

**Ohio Blower Co., The**, 5119 Perkins Avenue, Cleveland.  
Gospel of Fresh Air. Booklet. 4 x 9 in. 24 pp.

**Sturtevant Co., B. F.**, Dept. B, Hyde Park, Boston.  
Sturtevant Heaters. Catalog, containing data, curves, tables and complete layouts for the use of architects in specifying heating and ventilating systems. 8½ x 11 in. 132 pp.

## WALL BOARD

**Carey Co., The Philip**, Lockland, Cincinnati.  
Carey "Cell-board" for Walls and Ceilings. Specifications. 8 x 11 in. 2 pp.

## WALL COVERINGS

**Standard Oil Cloth Company, Inc., The.**, Dept. I, 320 Broadway, New York.  
Sanitas Modern Wall Covering. Booklet. 5 x 7 in. 28 pp. Color plates.  
Hints to Decorators. Booklet. 5 x 7 in. 12 pp. Colored inserts.  
What They Say About Sanitas. Booklet. 5 x 7 in. 27 pp.  
Selling Helps. Booklet. 5 x 7 in. 24 pp.

## WATERPROOFING

**Anti-Hydro Waterproofing Co.**, 9 Orchard Street, Newark, N. J. (Singer Building, N. Y. C.)  
Concrete Hardener Waterproofing. Booklet. 6½ x 8½ in. 8 pp.

## WATERPROOFING — Continued

**Ceresit Waterproofing Co.**, 906 Westminster Building, Chicago.  
Catalog and Specifications for Waterproofing, Damp-proofing and Floor Hardening. 8½ x 11 in. 36 pp.  
Ceresit Waterproofer for June and July. 8½ x 11 in. 4 pp.  
File Summary of C. W. Co. Products. 8½ x 11 in.

**General Fireproofing Co., The**, Youngstown, Ohio.  
Waterproofing Handbook. 6 x 9 in. 88 pp.

**Sandusky Cement Co., The**, Dept. S, Engineers' Building, Cleveland, Ohio.  
Medusa Waterproofing. Booklet. 7 x 9 in. 36 pp.

**Sonneborn Sons, Inc., L.**, Dept. 4, 264 Pearl St., New York.  
Concrete and Lapidolith. Treatise on concrete construction and the use of Lapidolith with it. 5¼ x 8¼ in. 20 pp.

**Toch Brothers**, Dept. 97, 320 Fifth Avenue, New York.  
"R. I. W." Toxement (Patented). Booklet. 5¼ x 8 in. 28 pp.

**Trus-Con Laboratories, The**, 1246 Trus-Con Building, Detroit, Mich.  
Architects' Handbook. 8½ x 11 in. 36 pp.  
Structural Waterproofing. 8½ x 11 in. 52 pp.  
Agatex Book. 5½ x 8 in. 18 pp.  
Descriptive Price List. 3½ x 6¼ in. 24 pp.

**Wadsworth, Howland Co., Inc.**, 139 Federal Street, Boston.  
Bay State Brick and Cement Coating. Booklet No. 10. Color plates.

## WATER SYSTEMS

**Armstrong Cork & Insulation Co.**, 132 24th St., Pittsburgh.  
Drinking Water Systems. Treatise. 6 x 9 in. 48 pp.

## WINDMILLS

**Corcoran, Inc., A. J.**, 763 Jersey Avenue, Jersey City, N. J.  
Windmills. Booklet.

## WINDOWS, CASEMENT

**Crittall Casement Window Co.**, Detroit, Mich.  
Universal Casements. Catalog No. 15, showing solid steel casement windows. Details. 9¼ x 12 in. 64 pp.

**Hope & Sons, Henry**, 103 Park Avenue, New York.  
Casement Windows. Details and sections. Catalog. 10 x 15 in. 187 pp.

**International Casement Co., Inc.**, Jamestown, N. Y.  
Casement Windows and Leaded Glass. Catalog. 10 x 14 in. 56 pp. Plates showing 16th century Tudor residences.

## WIRE FENCES

**Wright Wire Company**, Worcester, Mass.  
Excelsior Rust Proof Fencing. Illustrated and descriptive booklet. 3½ x 6 in. 16 pp.

## WOOD

**Gum Lumber Manufacturers' Association**, 1304 Bank of Commerce Building, Memphis, Tenn.  
Red Gum Facts. Catalog. 5½ x 8½ in. 20 pp.  
Technical Information about Red Gum. Catalog. 5½ x 9 in. 20 pp.

**North Carolina Pine Association**, 83 Bank of Commerce Building, Norfolk, Va.  
Architects' Reference Book. Booklet. 8½ x 11 in. 16 pp. Color plates.  
Home Builders' Book. 5 x 9 in. 24 pp. Color plates.

**Northern Hemlock and Hardwood Mfr's Assn.**, 205 F. R. A. Building, Oshkosh, Wis.  
Birch Interiors. Booklet. 9¼ x 12 in. 46 pp.  
Beautiful Birch for Beautiful Woodwork. Leaflet. 8½ x 11½ in.  
Serviceability and Qualities of Birch. Booklet. 8½ x 11 in. 7 pp.  
Rules for the Inspection of Hemlock Lumber. Booklet. 3½ x 6¼ in. 32 pp.

**Southern Cypress Manufacturers' Association**, 1234 Hibernia Bank Building, New Orleans.  
Cypress Pocket Library. Covers all uses for cypress. 41 units. 3¼ x 5½ in.

**Southern Pine Association**, Dept. C-2, Interstate Bank Building, New Orleans, La.  
Rules for Grading Southern Yellow Pine Timbers. Treatise. 3½ x 6 in. 24 pp.  
Creosoted Wood Block Floors. Booklet. 7 x 10 in. 32 pp.  
Directions for Furnishing Southern Yellow Pine. Technical booklet. 7 x 10 in. 20 pp.  
Manual of Standard Wood Construction. Scientific handbook. 4½ x 6½ in. 150 pp.

**White Pine Bureau**, 132 Madison Avenue, New York.  
Specification Book — Classified Recommended Uses for White Pine. Illustrating the various standard grades and indicating their proper uses. 8½ x 11 in. 196 pp.  
Three Story Houses of New England. Architectural monograph, Vol. III, No. 1. 8½ x 11 in. 16 pp.  
Early Wooden Architecture of Andover, Mass. Monograph. Vol. III, No. 2. 8½ x 11 in. 16 pp.  
Old Houses of Newburyport, Mass. Monograph. Vol. III, No. 3. 8½ x 11 in. 16 pp.





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Most house owners have a personal preference for certain kinds and colors of wall covering.

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The treads consist of 5" x 5" dark gray Linotile with  
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TO provide stair treads for public buildings, at once safe and durable, yet in thorough harmony with the cold beauty and classic dignity of marble, has been no mean problem. But with

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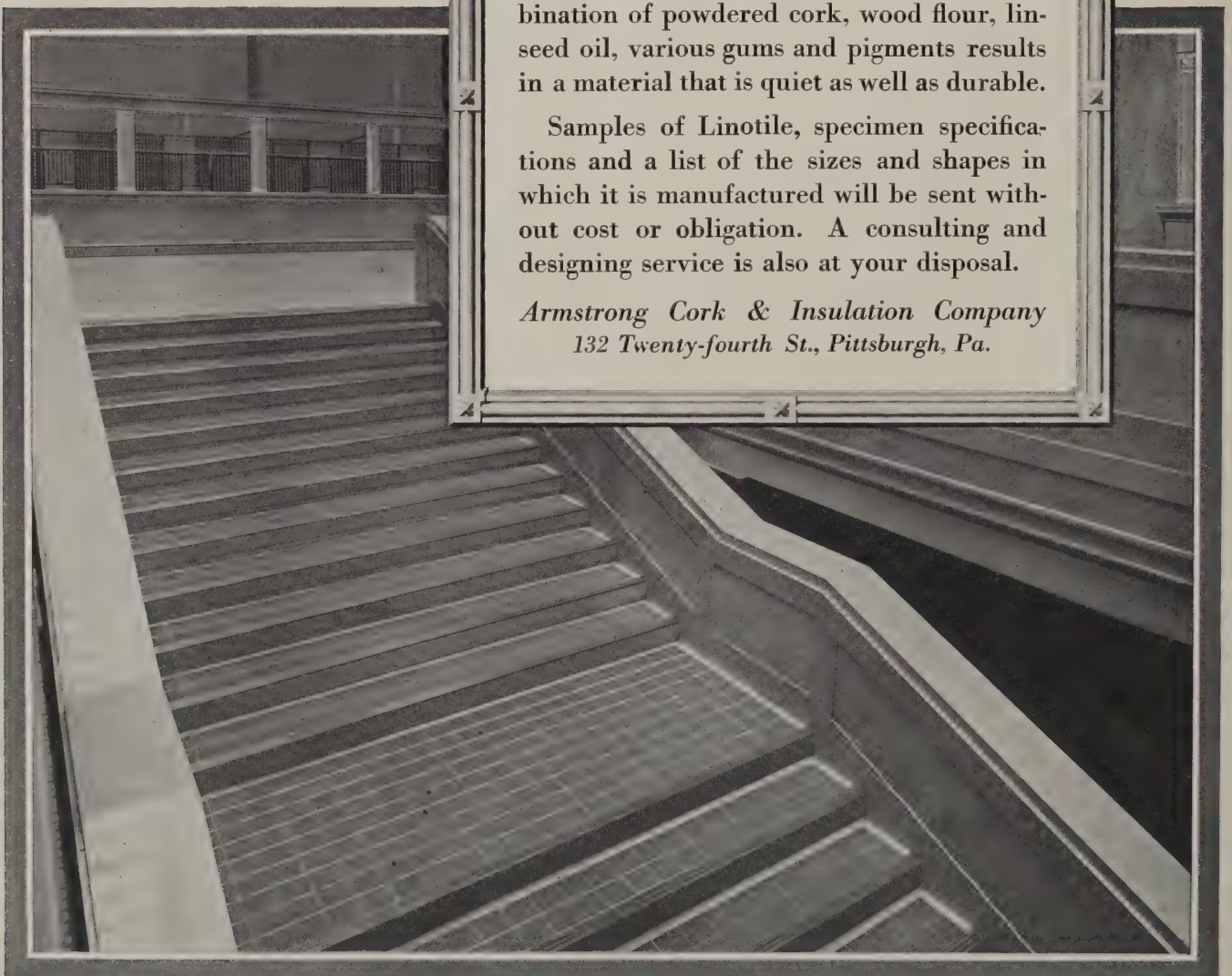
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available in eleven mellow colors, the solution has become comparatively simple. It resolves itself into a matter of choosing the correct shades and creating a design that will conform to the architectural order.

The quiet beauty of this flooring lends an atmosphere of dignified elegance. And where stairs are treaded with Linotile, the noise of hurrying feet is silenced. A combination of powdered cork, wood flour, linseed oil, various gums and pigments results in a material that is quiet as well as durable.

Samples of Linotile, specimen specifications and a list of the sizes and shapes in which it is manufactured will be sent without cost or obligation. A consulting and designing service is also at your disposal.

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Architects—D. H. Burnham & Company, Chicago, Ill.  
Contractors—Burnham Company, Chicago, Ill.  
Heating Contractor—George Dickson, Philadelphia, Pa.

JOHN WANAMAKER COMPANY  
PHILADELPHIA, PA.

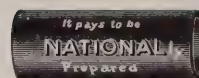
Plumbing Contractor—William McCoach, Philadelphia, Pa.  
Steel Work Fabricated by American Bridge Company

Another "NATIONAL" Traded Building—(See following page)

# "NATIONAL" Pipe in Large Buildings



## John Wanamaker Company Building Department Store



☛ The Department Store of John Wanamaker Company was among the first of a now notable group of similar institutions which have acquired an international reputation.

☛ In order to keep pace with the tremendous requirements of modern business, many buildings, which were considered the acme of convenience less than a score of years ago, have been abandoned because so far below today's demands and have been replaced by entirely new structures.

☛ Such a one is the John Wanamaker Store, a magnificent new building recently erected and one of the "show places" of Philadelphia.

☛ When it is remembered that this great building is filled with merchandise of every description, much of it highly perishable, mere ordinary precaution would suggest that only such pipe should be installed as had proved reliable in similar service.

☛ No chances were taken. "NATIONAL" Pipe was specified and installed, because it was found that "NATIONAL" Pipe is the pipe of character, with an established reputation for reliable, continuous service year in and year out. Likewise, many of the largest and finest buildings in the country are "NATIONAL"ized.

☛ Complete information about "NATIONAL" Pipe may be found on pages 1339-1351, inclusive, of the 1917 edition of Sweet's Catalogue.

☛ This is the fifth of a series of "NATIONAL"ized buildings as follows:

THE UNION ARCADE, Pittsburgh, Pa.

American Architect, Feb. 21st, pages 60-61

Architectural Forum, March, pages 41-42

Buildings & Building Management, May, pages 23-24

THE EQUITABLE BUILDING, New York, N. Y.

American Architect, March 21st, pages 19-20

Architectural Forum, April 1st, pages 35-36

CONTINENTAL & COMMERCIAL NATIONAL BANK BUILDING, Chicago, Ill.

American Architect, May 2nd, pages 21-22

Architectural Forum, May, pages 45-46

Buildings & Building Management, June, pages 23-24

HOTEL TRAYMORE, Atlantic City, N. J.

Architectural Forum, June, pages 39-40

Buildings & Building Management, July, pages 23-24

☛ To readily identify "NATIONAL" material and as protection to manufacturer and consumer alike, the practice of National Tube Company is to roll in raised letters of good size on each few feet of every length of welded pipe the name "NATIONAL" (except on the smaller butt-weld sizes, on which this is not mechanically feasible) on the smaller butt-weld sizes the name "NATIONAL" appears on the metal tag attached to each bundle of pipe.

☛ When writing specifications or ordering tubular goods, al-

LOOK FOR THE MARK

Name Rolled in Raised Letters on National Tube Company Pipe

ways specify "NATIONAL" pipe, and identify as indicated.

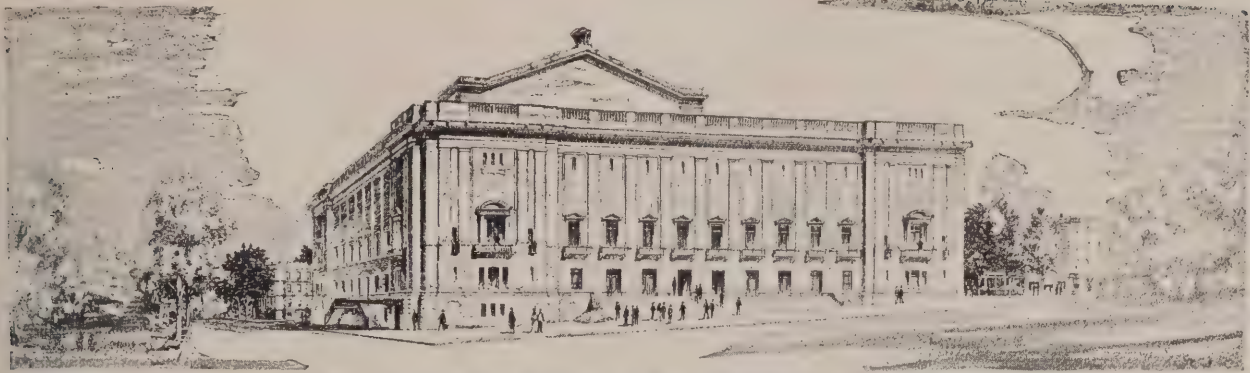
☛ In addition, all sizes of "NATIONAL" welded pipe four in. and under are subjected to a roll-knobbing process known as Spelterizing to lessen the tendency to corrosion especially in the form of pitting. This Spelterizing process is peculiar to "NATIONAL" pipe to which process National Tube Company has exclusive rights.

☛ "NATIONAL" pipe was awarded the GRAND PRIZE (highest possible award) at Panama Pacific International Exposition, 1915.

## NATIONAL TUBE COMPANY

(See preceding page for illustration)





SHERARDUCT was used exclusively in the magnificent Public Auditorium, Portland, Oregon. This building was opened for the Rose Festival, June, 1917.

# SHERARDUCT

*Sherardized Rigid Steel Conduit*

**National Metal Molding Co.**

*Manufacturers of  
Electrical Conduits & Fittings*  
1113 Fulton Building, PITTSBURGH, PA.

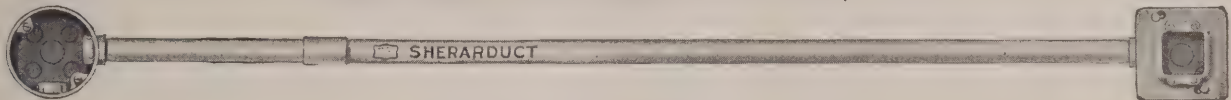
Architects  
**Freedlander & Seymour**  
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Associate Architects  
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### Why the Year of Manufacture is Rolled in Byers Pipe

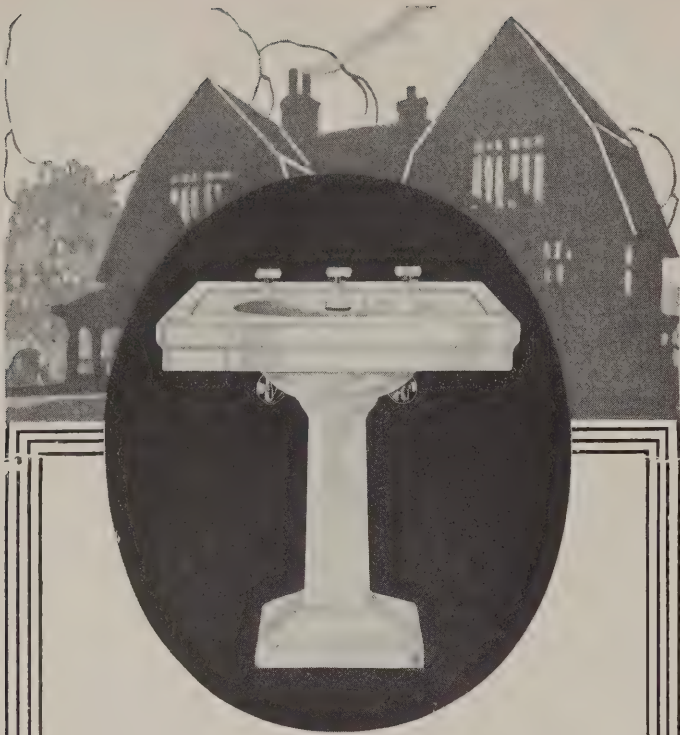
TO enable pipe users to determine how long any length of Byers pipe has been in service, the *Year of Manufacture* is now rolled in Byers pipe. It signifies the makers' own faith in their product and their desire to stand on its service record, past and future. Byers—and Byers only—is thus marked. The two figures indicating the year, together with the Byers name, appear on the pipe every 3 or 4 feet.

Send for BULLETIN No. 27  
"The Experience of Practical Men"

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Established 1864

PITTSBURGH, PA.



After all it is the detail that decides the success or failure of a plumbing fixture. Detail has been developed to the highest degree in

## THE TRENTON POTTERIES CO. "Impervio" China Lavatories

The bowl itself is made to insure absolute drainage of the last drop of water.



It seems like a simple feature, but you'd be surprised to know how frequently it is overlooked.

When you stop to consider that China lavatories are hand made, you will marvel at the sureness of line, the even glazing—the general satisfactory appearance of "Impervio" Lavatories.

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Trenton, N. J., U. S. A.

Watrous  
Duojet  
Wall  
Closet



Showing  
Method  
of  
Support

## Designed for Efficiency

A QUICK, positive flush and refill action, eliminating water waste entirely, is only one feature of superior excellence, and economy associated with the Watrous Duojet Closet. Ordinary syphon jet closets are "back numbers" in comparison.

Simplicity of installation and operation is a fundamental of the Watrous principle. The Watrous Wall Closet, here illustrated, is rigidly supported by a one-piece flange. An example of the Watrous plan for saving valuable wall space and the elimination of obstructions from the floor.

*It will pay you to know all about the Watrous line.  
Write to-day, on your letterhead, for complete catalog*

## The Imperial Brass Mfg. Co.

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*Exclusive Manufacturers of the Celebrated Watrous Line*

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**WATROU**  
SANITARY  
PLUMBING  
FIXTURES  
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fully meet the modern demand for a combination of *beauty* and *service*. They are worthy representatives of the great "Standard" line of fixtures for Bath, Kitchen, Laundry, etc.

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## Standard Sanitary Mfg. Co.

Dept. 4

Pittsburgh, Pa.







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there is a suitable KOHLER Bath Tub, Lavatory and Sink. You are sure to meet the needs of your client by specifying

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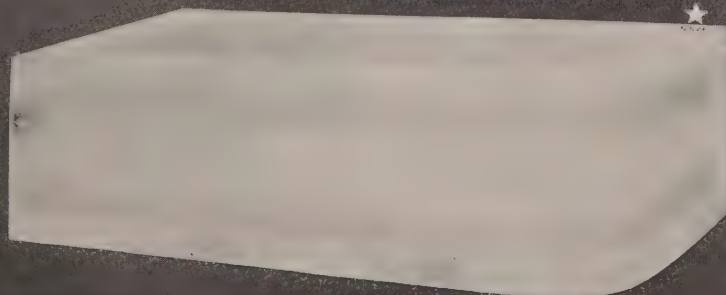
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"Viceroy Bath"—Plate V-14 (Patent Applied for and Name Reg. U. S. Pat. Off.)

"Columbia" Lavatory—Plate K-205-A



# SOIL PIPE SUPREMACY

CAST IRON SOIL LINES

CAST IRON WASTE LINES

CAST IRON LEADER LINES



*Profit  
by their  
Experience*

ARCHITECTS  
PLUMBERS  
ENGINEERS  
BUILDERS

## Use CAST IRON SOIL PIPE

for SOIL LINES VENT LINES  
LEADER LINES WASTE LINES

No corrosion - No menace of leaking sewage and sewer gases - No tearing out of floors and walls after pipe is installed

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for HOUSE DRAINS HOUSE SEWERS

No pollution under cellars - No stoppage by tree roots - No danger of breakage by jar or settlement - No costly replacements

CAST IRON SOIL PIPE LASTS  
LONGER THAN THE BUILDING

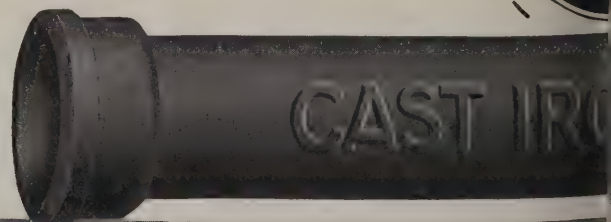
IN THE  
BUILDING  
UNDER THE  
GROUND

SANITATION ECONOMY PERMANENT SERVICE

Specifications and literature will be mailed upon request by any or all of the following independent and competing makers of Cast Iron Soil Pipe and Fittings

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|-------------------------------------|-------------------|-------------------------------|---------------------|
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| Johnson Co., J. D.                  | New York, N. Y.   | Albendroth Brothers           | Port Chester, N. Y. |
| Krupp Foundry Co.                   | Lansdale, Pa.     | Alabama Pipe & Foundry Co.    | Anniston, Ala.      |
| Medina Foundry Co.                  | Medina, N. Y.     | American Enameling Mfg. Corp. | New York, N. Y.     |
| National Foundry Co. of N. Y., Inc. | Brooklyn, N. Y.   | American Foundry & Pipe Co.   | Penns Sta., Pa.     |
| National Pipe & Foundry Co.         | Atlanta, Ala.     | Anniston Foundry Co.          | Anniston, Ala.      |
| Reading Foundry & Supply Co.        | Reading, Pa.      | Bessemer Soil Pipe Co.        | Bessemer, Ala.      |
| Salem Brass & Iron Mfg. Co.         | Salem, N. J.      | Campbell Mfg. Co.             | Gadsden, Ala.       |
| Sanitary Co. of America             | Linfield, Pa.     | Cassidy-Hodges Co., The       | Chattanooga, Tenn.  |
| Somerville Iron Works               | New York, N. Y.   | Central Foundry Co.           | New York, N. Y.     |
| Standard Foundry Co.                | Anniston, Ala.    | Charlotte Pipe & Foundry Co.  | Charlotte, N. C.    |
| Superior Mfg. Co.                   | Bessemer, Ala.    | Coxs Pipe & Foundry Co.       | Birmingham, Ala.    |
| Union Foundry Co.                   | Anniston, Ala.    | Crown Pipe & Foundry Co.      | Jackson, Ohio       |
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SANITATION - ECONOMY  
IN BUILDING  
UNDER GROUND



*"Use Soil Pipe where Soil"*



# IN HOUSE DRAINAGE

CAST IRON VENT LINES

CAST IRON HOUSE DRAINS

CAST IRON HOUSE SEWERS

The Cast Iron Soil Pipe in this composite group of New York Buildings — hotels, apartment houses, office buildings, and loft buildings — will last longer than the buildings themselves

## Why <sup>CAST IRON</sup> Soil Pipe should be used in the Building

Cast Iron Malleable Vent Fitting

Wrought Pipe with Cement Coating  
Cast Iron Soil Pipe

It has been proven that coating with paint, tar, or cement or galvanizing does not render immune to rust any pipe which will not resist corrosion **uncoated**

The menace of leaking sewage and drain air is present when other than Cast Iron Soil Pipe, drains and vents are used.

## Why <sup>CAST IRON</sup> Sewers are Best

The picture shows vitrified pipe broken and choked with tree roots, causing stoppage and pollution: a condition impossible where Cast Iron soil pipe is used.

**CAST IRON SOIL PIPE** is made in long lengths. Where a sanitary test is made, it is installed in less time and at less cost than pipe made in two-foot sections.

**CAST IRON SOIL PIPE**—underground—is permanently tight and lasts for centuries.

4-INCH CAST IRON SOIL PIPE SEWERS REPLACE 6-INCH VITRIFIED SEWERS



PERMANENT SERVICE —  
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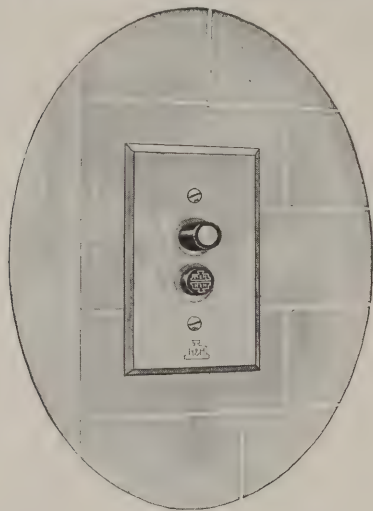
IN SOIL PIPE

A-1025

Pipe should be used



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THIS is a brass switch plate, white enameled. It is perfectly formed, with a very smooth, hard, durable finish. It harmonizes with white walls and woodwork and has a clean, spotless appearance which attracts.

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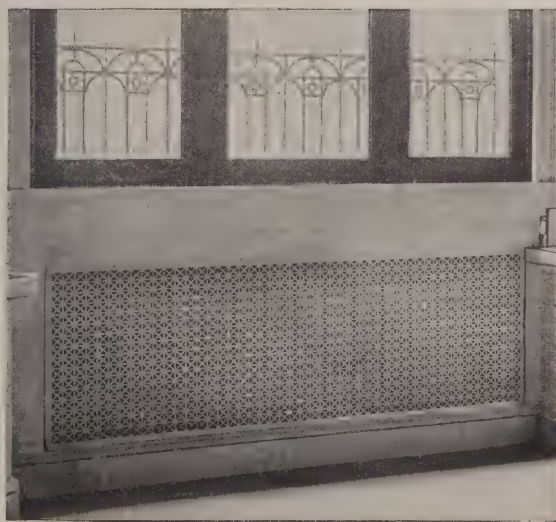
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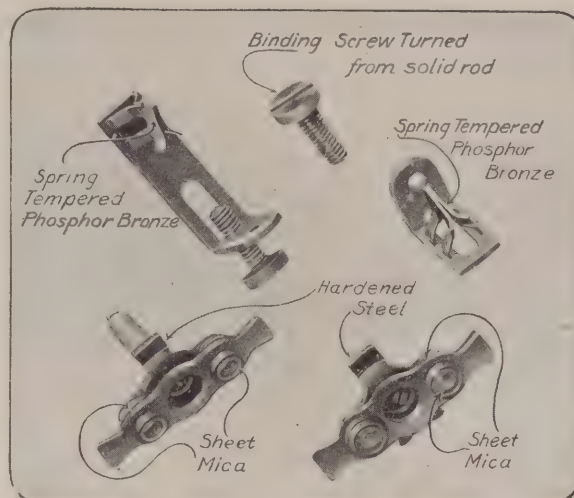
are combined so skilfully with the interior design as to lend a particularly pleasing relief. Architects interested are welcome to photographs.

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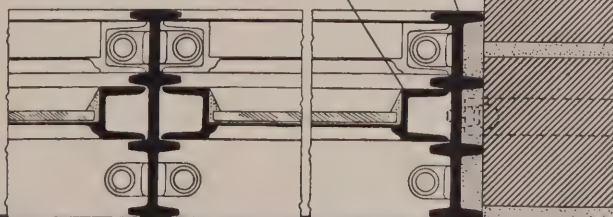
Double rise of  
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One-piece rolled steel Jambs and Mullions

Solid one-piece Members,  
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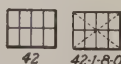
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53 53-1-6-1



63 63-1-8-1



34 34-1-6-1



44 44-1-8-1



54 54-1-6-1



64 64-1-8-1



35 35-1-6-2 35-1-6-1



45 45-1-8-2 45-1-8-1



55 55-1-6-2 55-1-6-1



65 65-1-8-2 65-1-8-1



36 36-1-6-3 36-1-6-1



46 46-1-8-3 46-1-8-1



56 56-1-6-3 56-1-6-1



66 66-1-8-3 66-1-8-1

Stock sizes of United Steel Sash. Furnished in two glass sizes, 12" x 18" and 14" x 20"

Table of Widths of Window Openings

| Width of Window Openings  | Size of Glass | Total Lights Wide | No. Sash Units |
|---------------------------|---------------|-------------------|----------------|
| 3' 3"                     | 12 x 18       | 3                 | 1              |
| 3' 9"                     | 14 x 20       | 3                 | 1              |
| 4' 3 1/2"                 | 12 x 18       | 4                 | 1              |
| 4' 11 1/2"                | 14 x 20       | 4                 | 1              |
| 5' 4"                     | 12 x 18       | 5                 | 1              |
| 6' 2"                     | 14 x 20       | 5                 | 1              |
| 6' 4 1/2"                 | 12 x 18       | 6                 | 1              |
| 6' 8" to 6' 9"            | 12 x 18       | 6                 | 2              |
| 7' 4 1/2"                 | 14 x 20       | 6                 | 1              |
| 7' 8" to 7' 9"            | 14 x 20       | 6                 | 2              |
| 8' 9" to 8' 10"           | 12 x 18       | 8                 | 2              |
| 10' 0 1/2" to 10' 2 1/2"  | 12 x 18       | 9                 | 3              |
| 10' 1" to 10' 2"          | 14 x 20       | 8                 | 2              |
| 10' 10" to 10' 11"        | 12 x 18       | 10                | 2              |
| 11' 1" to 11' 3"          | 12 x 18       | 10                | 3              |
| 11' 6 1/2" to 11' 8 1/2"  | 14 x 20       | 9                 | 3              |
| 12' 1 1/2" to 12' 3 1/2"  | 12 x 18       | 11                | 3              |
| 12' 6" to 12' 7"          | 14 x 20       | 10                | 2              |
| 12' 9" to 12' 11"         | 14 x 20       | 10                | 3              |
| 12' 11" to 13' 0"         | 12 x 18       | 12                | 2              |
| 13' 2" to 13' 4"          | 12 x 18       | 12                | 3              |
| 13' 5 1/2" to 13' 8 1/2"  | 12 x 18       | 12                | 4              |
| 13' 11 1/2" to 14' 1 1/2" | 14 x 20       | 11                | 3              |
| 14' 2 1/2" to 14' 4 1/2"  | 12 x 18       | 13                | 3              |
| 14' 11" to 15' 0"         | 14 x 20       | 12                | 2              |
| 15' 2" to 15' 4"          | 14 x 20       | 12                | 3              |
| 15' 3" to 15' 5"          | 12 x 18       | 14                | 3              |
| 15' 5 1/2" to 15' 8 1/2"  | 14 x 20       | 12                | 4              |
| 15' 6 1/2" to 15' 9 1/2"  | 12 x 18       | 14                | 4              |
| 16' 3 1/2" to 16' 5 1/2"  | 12 x 18       | 15                | 3              |
| 16' 4 1/2" to 16' 6 1/2"  | 14 x 20       | 13                | 3              |
| 17' 4" to 17' 6"          | 12 x 18       | 16                | 3              |
| 17' 7" to 17' 9"          | 14 x 20       | 14                | 3              |
| 17' 7 1/2" to 17' 10 1/2" | 12 x 18       | 16                | 4              |
| 17' 10 1/2" to 18' 1 1/2" | 14 x 20       | 14                | 4              |
| 18' 4 1/2" to 18' 6 1/2"  | 12 x 18       | 17                | 3              |
| 18' 9 1/2" to 18' 11 1/2" | 14 x 20       | 15                | 3              |
| 19' 5" to 19' 7"          | 12 x 18       | 18                | 3              |
| 19' 8 1/2" to 19' 11 1/2" | 12 x 18       | 18                | 4              |
| 20' 0" to 20' 2"          | 14 x 20       | 16                | 3              |
| 20' 3 1/2" to 20' 6 1/2"  | 14 x 20       | 16                | 4              |
| 21' 2 1/2" to 21' 4 1/2"  | 14 x 20       | 17                | 3              |
| 21' 9 1/2" to 22' 0 1/2"  | 12 x 18       | 20                | 4              |
| 22' 5" to 22' 7"          | 14 x 20       | 18                | 3              |
| 22' 8 1/2" to 22' 11 1/2" | 14 x 20       | 18                | 4              |
| 23' 10 1/2" to 24' 1 1/2" | 12 x 18       | 22                | 4              |
| 25' 1 1/2" to 25' 4 1/2"  | 14 x 20       | 20                | 4              |
| 25' 11 1/2" to 26' 2 1/2" | 12 x 18       | 24                | 4              |
| 27' 6 1/2" to 27' 9 1/2"  | 14 x 20       | 22                | 4              |
| 29' 1 1/2" to 30' 2 1/2"  | 14 x 20       | 24                | 4              |

Table of Heights of Window Openings

| Height of Window Openings | Size of Glass | Total Lights High | No. Sash Units |
|---------------------------|---------------|-------------------|----------------|
| 3' 2"                     | 12 x 18       | 2                 | 1              |
| 3' 6"                     | 14 x 20       | 2                 | 1              |
| 4' 8 1/2"                 | 12 x 18       | 3                 | 1              |
| 5' 2 1/2"                 | 14 x 20       | 3                 | 1              |
| 6' 3"                     | 12 x 18       | 4                 | 1              |
| 6' 11"                    | 14 x 20       | 4                 | 1              |
| 7' 9 1/2"                 | 12 x 18       | 5                 | 1              |
| 8' 7 1/2"                 | 14 x 20       | 5                 | 1              |
| 9' 4"                     | 12 x 18       | 6                 | 1              |
| 10' 4"                    | 14 x 20       | 6                 | 1              |



# An Expert Opinion on The Winslow Window

**W**E feel that we can speak with conviction upon the subject of the Winslow Window, as our conclusions are based upon consultations with architects and engineers who are familiar with every angle of this subject.

Present installations show that the advantages of this window can be divided under the following twelve headings:

- 1 The Winslow Window meets the popular demand for an attractive and durable fireproof window for public buildings as it is met by no other type.
- 2 There is no cost of upkeep other than possible glass replacement, as metal parts are entirely composed of bronze and low-carbon rolled steel.
- 3 Special manufacturing equipment and highest quality of material give this window an unusually neat and finished appearance.
- 4 Entire freedom from sash cords or chains, pulleys and weights obviates repairs and makes installation labor cost much less.
- 5 The Winslow Window is weather-tight to an unusual degree. Interlocking construction and two-point contact sections render weather strips superfluous. No air leakage during extreme weather. No dust when closed.
- 6 The window cannot stick or bind in adjustment as the weight of the upper sash balances that of the lower. All wearing surfaces are bushed with hard bronze to prevent "freezing."
- 7 The window can be cleaned from either inside or outside the building. Inside washing is particularly advantageous because of elimination of risk.
- 8 Renewal of glass in either sash is easily made from inside the building by unscrewing the bronze screws which secure the glass stops.
- 9 Because of slender construction the Winslow Window affords approximately 20 per cent more light from a given opening than the most efficient double-hung window.
- 10 It is the only type of steel window that affords direct ventilation without direct draft. A 6-inch cross opening may be had at the center without breaking contact at head or sill. When full open this type gives 80 per cent of the total masonry opening, as compared with 50 per cent available with double-hung sash. Ventilation is then furnished at head, center and sill.
- 11 The shades are fitted to the sash in such a manner that they do away with the necessity of awnings, thereby saving much bother and expense of upkeep. Incoming air does not disturb shades when window is open, and both ventilation and direct light are secured without permitting the entrance of sunlight.
- 12 In practically all installations in office buildings this window has been used with telling effect in renting the space. Light, heat and ventilation are three most important features in the consideration of office building tenants, and the Winslow Window is an exceedingly important factor in each of these problems.

## The Winslow Window

(Austral Balance)

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Full information and printed matter upon request

## WINSLOW BROS. COMPANY

Main Office and Works : 4600-4700 West Harrison St., Chicago

Mailing Address : P. O. Box No. 803

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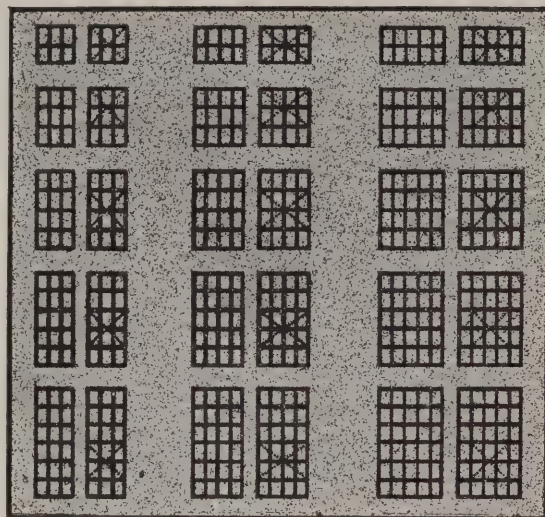


Combine Y Heights with Y Widths—Z Heights with Z Widths

**2 PANES HIGH**Y Height 3' 1 $\frac{5}{8}$ "  
Z Height 3' 5 $\frac{3}{8}$ "**3 PANES HIGH**Y Height 4' 8"  
Z Height 5' 2"**4 PANES HIGH**Y Height 6' 2 $\frac{3}{4}$ "  
Z Height 6' 10 $\frac{3}{4}$ "**5 PANES HIGH**Y Height 7' 8 $\frac{3}{4}$ "  
Z Height 8' 6 $\frac{3}{4}$ "**6 PANES HIGH**Y Height 9' 3 $\frac{3}{4}$ "  
Z Height 10' 3 $\frac{3}{4}$ "

Y=12" x 18" Glass

Z=14" x 20" Glass

**3 PANES WIDE**Y Width 3' 2"  
Z Width 3' 8"**4 PANES WIDE**Y Width 4' 2 $\frac{3}{4}$ "  
Z Width 4' 10 $\frac{3}{4}$ "**5 PANES WIDE**Y Width 5' 2 $\frac{3}{4}$ "  
Z Width 6' 0 $\frac{3}{4}$ "

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STORE FRONTS

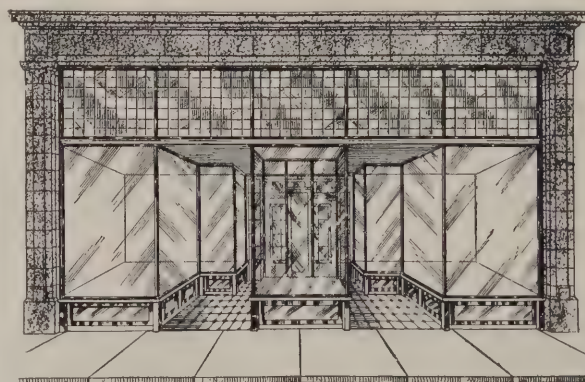
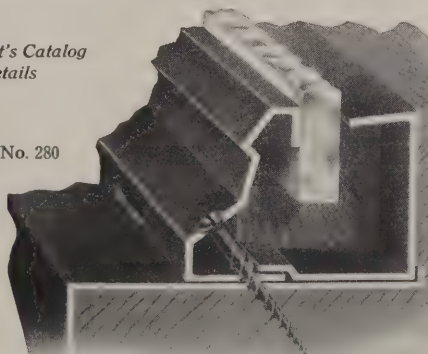
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See  
Sweet's Catalog  
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Sash No. 280



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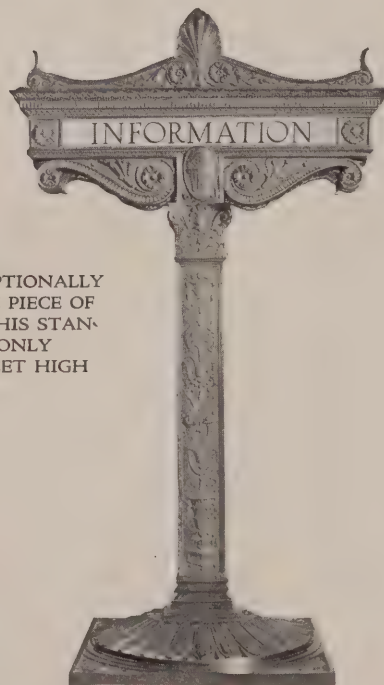
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No. 198  
Height, 3' 8½" to  
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Wall plate, 11" di-  
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Residence of C. E. Johnson  
Milwaukee, Wis.

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waterproofed with  
Medusa Waterproofing

Fitzhugh Scott, *Architect*  
William Gregory, *Contractor*

## Insures the Permanent Beauty of Stucco

# MEDUSA WATERPROOFING

PATENTED PASTE AND POWDER

BY the absolute prevention of efflorescence and hair cracks, Medusa Waterproofing makes stucco a dependable exterior finish. Stucco over metal lath should always be waterproofed with Medusa to prevent corrosion of the lath.

Medusa Waterproofing is permanent in effect. It is the logical and, in the long run, the least expensive medium for waterproofing and dampproofing cement and concrete above or below ground.

The color strength and setting of Portland cement are not affected

by the incorporation of Medusa Waterproofing. There is no added cost for labor.

Medusa Waterproofing is the original integral waterproofing. It has ten years of successful widespread use behind it.

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**The Sandusky Cement Co.**

Dept. S

CLEVELAND, OHIO



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in New York City is one of Fifth Avenue's newest landmarks. The selection of Pennsylvania Portland Cement for the concrete work insured maximum results in appearance. Where distinction is as important as permanence, Pennsylvania Cement is often *insisted* upon because of its uniform quality and color, and freedom from impurities. Ask your dealer for Pennsylvania. If he cannot supply you, write direct to Pennsylvania Cement Company, 30 East 42nd St., New York.

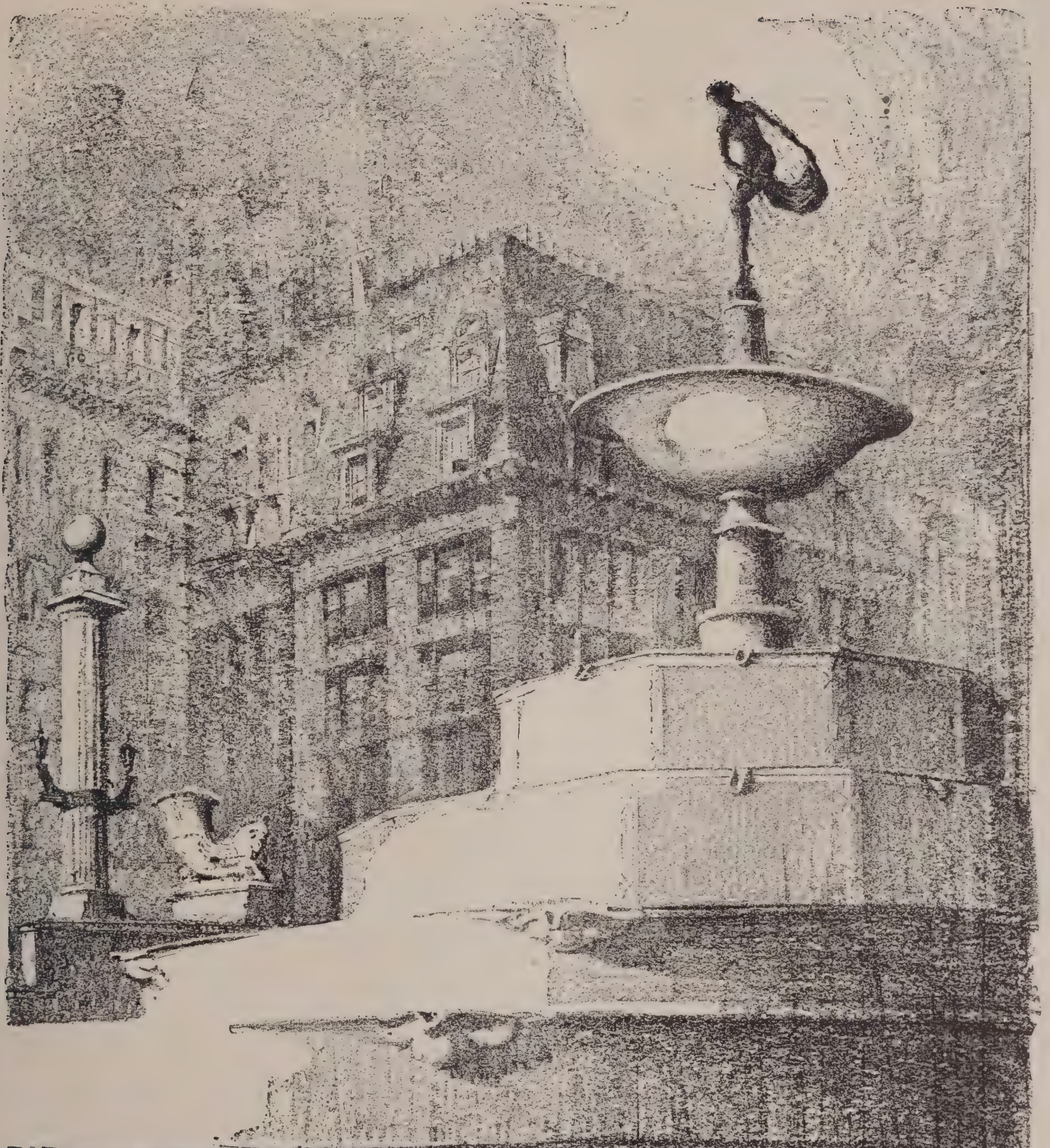
*"One Source—One Mill—One Standard"*

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PENNSY  
PORTLAND

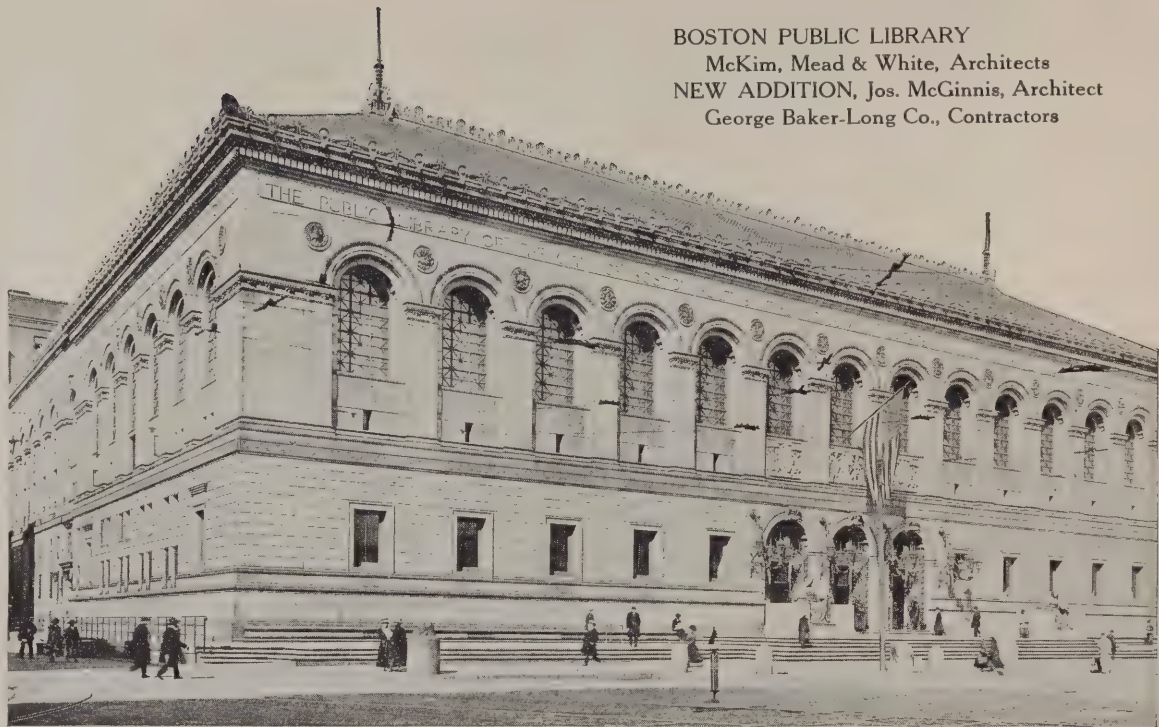




LVANIA  
CEMENT

Hugh Ferriss





BOSTON PUBLIC LIBRARY  
 McKim, Mead & White, Architects  
 NEW ADDITION, Jos. McGinnis, Architect  
 George Baker-Long Co., Contractors

## A Noteworthy Example

of building conservation is presented in the new Boston Public Library Addition. The foundations of this magnificent building were protected against damage or deterioration resulting from water or moisture by being waterproofed with

### Trus-Con Waterproofing Paste, *Concentrated*

This material was selected to conserve the foundations because thousands of cases had demonstrated it to be the most certain, most effective and at the same time most economical waterproofing material available.

*"Structural Waterproofing," a handsomely bound and illustrated volume, 8½" x 11", will give you full information upon Trus-Con Waterproofing Paste, Concentrated. A request on letter head will bring you a copy free of charge. Write to-day.*

## The Trus-Con Laboratories

*Manufacturers and Inventors of*

Waterproofings, Dampproofings, Technical Coatings and Floor Hardeners  
 1246 Trus-Con Building DETROIT, MICHIGAN



## Concrete for Speed

You want quick construction, more to-day than ever before, if you are planning an industrial building. But, besides speed, you also want fire protection, permanence and economy.

There is one best answer, reinforced concrete—it will give the best average of the qualities you want. Materials are more easily secured, they are standard, they do not have to be made specially. The actual construction work is rapid, too. The result is a better building, and yet it is moderate in first cost and lowest in ultimate cost.

The opportunities for good architectural treatment of concrete are broad for the architect who is interested. Are *you* interested?

### Atlas Service to Architects

We will furnish data and statistics on reinforced concrete and if desired will co-operate in developing economical layouts, designs, etc. Send for our Factory Book. Use the coupon.

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S. Scott Joy, Architect  
Geo. A. Fuller, Contractor*



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THE ATLAS PORTLAND CEMENT COMPANY, 30 Broad St., N. Y., or Corn Exchange Bank Bldg., Chicago. Send book on Industrial Buildings and Information about Atlas Service to name and address written on margin, particularly subjects checked.

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—What it is:

*Hydrated Lime is a product formed by the addition of accurate quantities of water to known weights of freshly burned quicklime, the finished material being a flour-like powder of great fineness and covering capacity.*

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Makes walls porous and dead so that they do not reflect or transmit sound.

Can be easily straightened and darbied on the walls.

Eliminates buckling of wood lath.

Will adhere to tile or concrete walls.

On account of its plasticity it is applied with less physical effort.

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Requires less lime for white coating.

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When wet up the mortar can be used immediately or can be allowed to stand several days before using.

Has a greater strength than old-fashioned lump lime mortar.

Gives all of the good results formerly accomplished with lump lime, but with none of the old disadvantages.

May be delivered on the job either neat or sanded.

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*Used for Years*

*Lapidolize  
your Concrete floors*

That is sound advice for your clients who have just laid new floors or are bothered by disintegrating old floors.

Architects and engineers have come to know that concrete floors will dust and disintegrate — if left untreated.

# LAPIDOLITH

TRADE MARK

the liquid chemical makes new or old concrete floors dust-proof, wearproof and waterproof.

The lapidolizing treatment should not be confused with integral hardners. It *chemically* hardens the *binder* in concrete, i.e., the Portland Cement.

Write for scientific proof and microphotographs.

Department 4

**L. SONNEBORN SONS, INC.**

*Manufacturers of Cemcoat  
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BREWSTER AUTOMOBILE PLANT

Floors protected with R. I. W. Cement Filler and Cement Floor Paint

## Detail!

THOSE six letters spell the most important word in the architect's lexicon! To the architect, it means his reputation; to the owner, it determines whether his building shall be a profitable investment or a costly white elephant.

**R.I.W. CEMENT FILLER**  
REMEMBER IT'S WATERPROOF  
**R.I.W. & CEMENT FLOOR PAINT**  
REG. U.S. PAT. OFF. PATENTED AS TO PORTLAND CEMENT FEB 27, 1901

effectively take care of one detail. Their use assures both architect and owner that the floors will never be a source of complaint; that oil, water and acids cannot soak into the cement, and that the pores will be scientifically sealed.

Dusting, too, is prevented. A surface treated with R. I. W. Cement Filler and Cement Floor Paint will not wear away in the fine grit that ruins stock and machinery and which loses tenants. Supplied in a wide range of colors, these preparations make cement floors look better, wear better and give more satisfactory service all around.

Write for descriptive literature, Dept. 97

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REMEMBER IT'S WATERPROOF  
**R.I.W.**

REG. U.S. PAT. OFF.

**STEEL NEED NOT RUST!**  
**WOOD NEED NOT ROT!**  
**NOR CONCRETE DUST!**

## Convincers



A. P. W. Paper Company, Albany, N. Y.  
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PAPER stock is dead weight, heavy to handle, and it must be trucked and re-trucked because it moves rapidly. Consequently the kind of floor in a paper mill or warehouse is of first importance, not only because of the severe wear to which it is subjected, but also because of the damage that can result from dust when that wear has worn down a concrete floor.

For these reasons the type of floor that is popular with paper concerns is the wearproof, dustproof, waterproof floor, laid with Master Builders Concrete Hardner and

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| Hollingsworth & Whitney<br><i>Waterville</i>            | Mead Pulp & Paper Co.<br><i>Dayton</i>  |
| American Paper Goods Co.<br><i>Kensington</i>           | Strathmore Paper Co.<br><i>Worono</i>   |
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So this important industry, in common with all important industries, is an enthusiastic user of Master Builders Method—the highest type of concrete floor construction—the preference of 21,000 concerns, businesses and individuals, with more than 80,000,000 sq. ft. in use.

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This is the sixth of a series of Master Builders Method installations that prove convincingly its foremost place as the standard of construction for concrete floors.

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Basements must be perfectly dry, cisterns must retain water perfectly, stucco must be protected against discoloration, hair cracking, and disintegration, foundations must resist water penetration. Ceresit Waterproofing Compound makes these results possible and permanent.

The use of Ceresit is an economical and effective method of insuring perfect waterproofness, no matter how great the water resistance, due to excessive pressure, may be.

A few pounds of Ceresit in each cubic yard of concrete does the work.

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It tells all about the seven C. W. Co. Products, with complete specifications for use. It is not a catalogue merely, but a condensed cyclopædia of information regarding waterproofing, damp-proofing, and concrete floor treatments.

Your business card or letter head will bring a copy to your desk.

**Ceresit Waterproofing Co.**

906 Westminster Bldg.

Chicago

### The Contents

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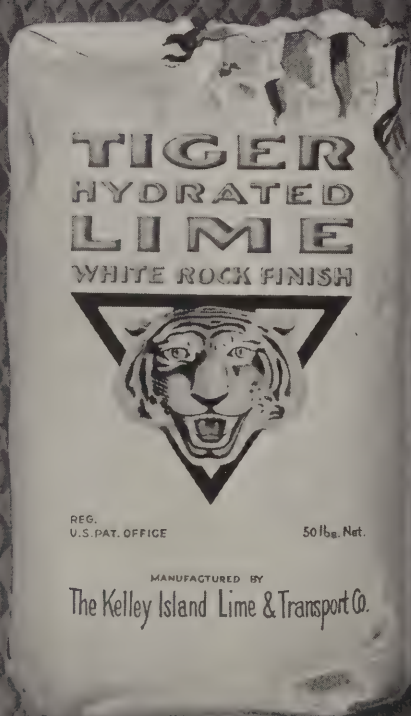
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Works  
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The free, smooth working qualities of Tiger Lime are secured: first, by using limestone of unusual quality; second, by burning and slaking it with unusual care.

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For example, if you are specifying 24 gage lath, set down 24 gage and also the exact weight, which for 24 gage is 3.4 pounds per square yard. Then you'll be sure to get the full weight necessary for strength and rigidity—for safe, economical outside stucco and interior plaster construction.

The vital essentials of strength, rigidity, safety, and permanence are made all the more certain when you specify Herringbone Rigid Metal Lath, which is always *full weight*. Make sure that the contractor brings it on the job.

From the standpoint of weight, Herringbone Lath measures up to the recommendations of the Concrete Institute, Associated Metal Lath Manufacturers, and the Building Codes of New York City and other metropolitan centers.

# Herringbone Rigid Metal Lath

The heavy longitudinal ribs, set at an angle of 45 degrees to the plane of the lath give exceptional strength and rigidity. The wide, flattened strands curl the plaster around the lath in an unbreakable grip. This extra strength and rigidity, this perfect "key" of lath and plaster, count heavily in the long run after the walls, partitions, and ceilings have been exposed for years to the attacks of rats, mice, decay, moisture, and perhaps even fire. No cracking or falling plaster. Herringbone stands the gaff.

If you specialize in stucco construction, the Herringbone Home—with the stucco and the interior plastering held together

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Why shouldn't you become known as the Herringbone Architect in your community? Establish the reputation of being the leading advocate of fire-safe, economical, and enduring residential construction.

Herringbone Rigid Metal Lath is self-furring, therefore saves the cost of wooden furring strips. When rightly handled, it saves labor and plaster.

*The Herringbone Catalog is of interest to architects because it contains complete information regarding metal lath and plaster construction*

## THE GENERAL FIREPROOFING COMPANY YOUNGSTOWN, OHIO

Manufacturers of Metal Lath, Concrete Reinforcements, Waterproofings

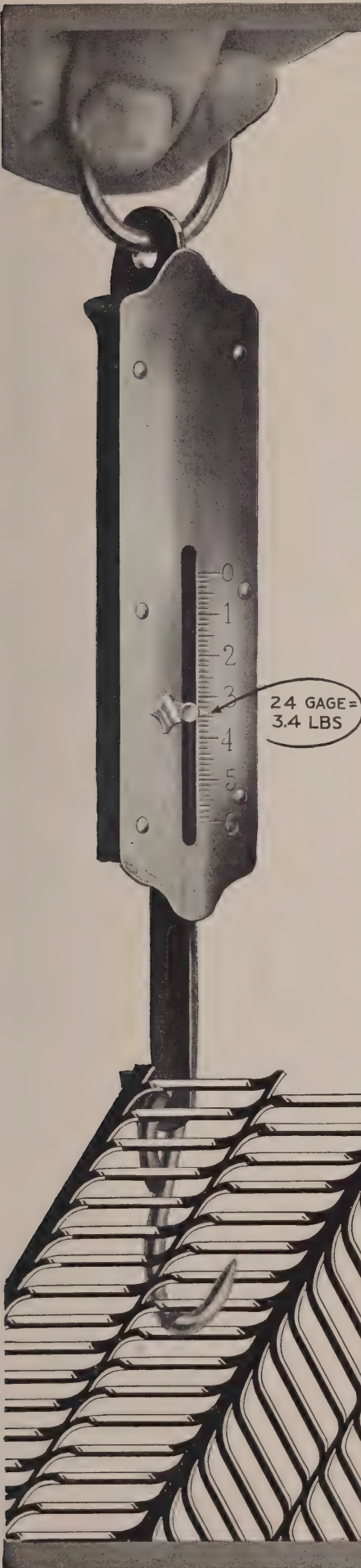
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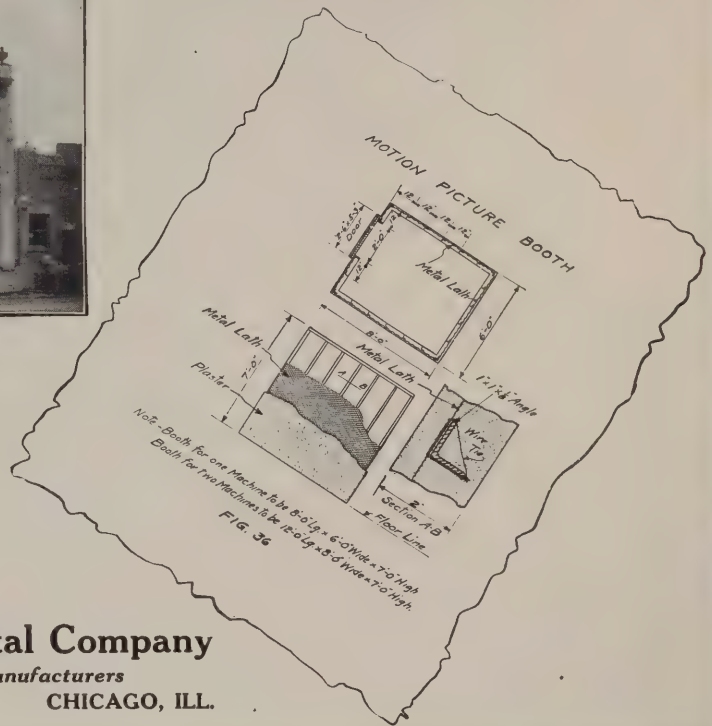




## Regent Theatre, Syracuse, N. Y.

E. A. Howard & Son, of Syracuse  
Architects

KNO-BURN Expanded Metal Lath was used in this attractive theatre. The accompanying detail shows how metal lath is used in constructing the booth for containing the machine and its operator.



## North Western Expanded Metal Company

Member of the Associated Metal Lath Manufacturers  
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ROCKEFELLER INSTITUTE, NEW YORK CITY  
Shepley, Rutan & Coolidge, Architects

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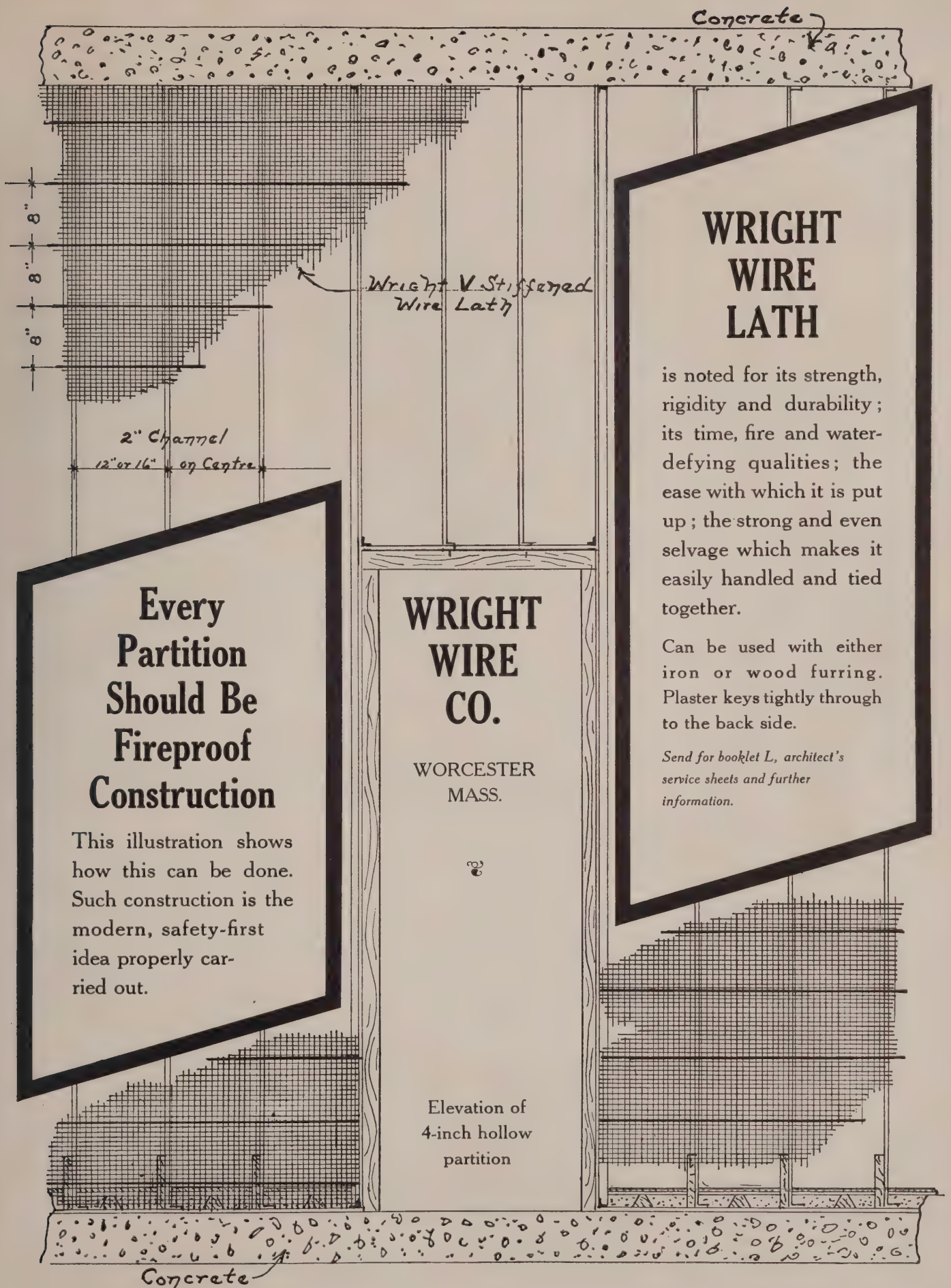
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Aqueducts, Subways, Railroad  
Work, Bridge Piers, Shafts, and  
Tunnels







# In Old New England

**Y**EARS ago Berger's Prong Lock Steel Studs were used in fireproof partitions and ceilings. This material was used in some of the buildings illustrated on this page.

As these studs were limited in their use, our engineers designed new members, greatly elaborating on the old system, so that now

## Berger's *Metal Lumber*

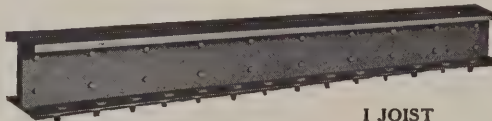
(Patented)

comprises a series of pressed steel joists and studs which in connection with Metal Lath are adapted to the construction of floors, partitions, roofs, suspended ceilings, exterior walls, column and girder covering and exterior wall furring.

Berger's Metal Lumber has been used in over 60 different classes of buildings in this and foreign countries. Its safety, strength, ease of erection and economy are the reasons.

The Brookline Apartment Block, Brookline, Mass., is being erected with this material.

Our engineering department is at the service of architects in making suggestions, estimates and layouts of Berger's Metal Lumber.



I JOIST

See Sweet's, pages 244-250, and  
send for Bulletin 12 F.

## The Berger Mfg. Company

CANTON, OHIO



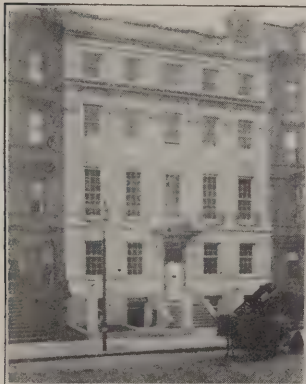
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Export Dept.: Berger Bldg., New York City, U. S. A.



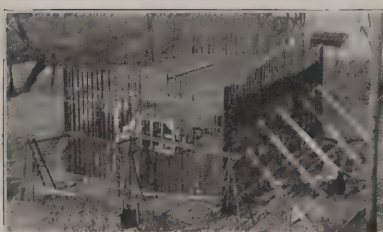
School Building, Winslow, Me.  
Architect and Engineer, J. L. Dean



The Merrill Apartments, Boston, Mass.  
Architect, Arthur A. Vinal



The Draper Residence, Boston, Mass.



McCall's & Co., Garage Building, Springfield, Mass.  
Architects, E. C. & G. C. Gardner



Marsh Building, New London, Conn.  
Architect, Dudley St. Clair Donnelly



Hamlet Street School Building, Fall River, Mass.  
Architect, R. T. C. Jackson



The Baptist Social Union Club, Boston, Mass.  
Architects, Brainerd, Leeds & Russell

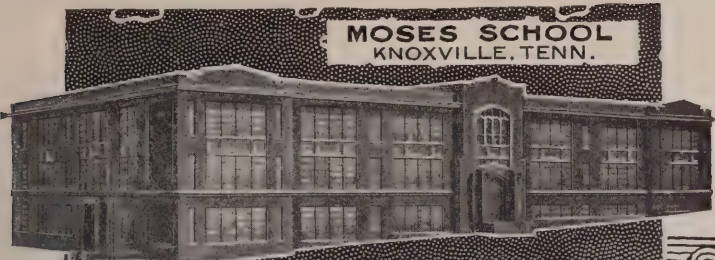


First National Bank, East Pepperell, Mass.  
Architects, Dykeman & Murray



The Longyear Residence, Brookline, Mass.





**MOSES SCHOOL**  
KNOXVILLE, TENN.

## ARCHITECTS

Moses School—R. F. Graf &amp; Sons, Knoxville.

Lincoln &amp; Palmer Schools—Helmle &amp; Helmle, Springfield.



**LINCOLN SCHOOL**  
SPRINGFIELD, ILL.



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SPRINGFIELD, ILL.

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**S**AFETY is the first consideration in modern school architecture; security for the children, protection from fire and weather and from dampness. In the search for material that insures maximum safety for pupils and for the building, leading school architects everywhere have accepted as the standard

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No other roofing offers such a record of long time service and satisfaction as Carey Roofing. It was the first composition roofing on the American market and its leadership has never been seriously challenged. The Underwriters Laboratories have approved it for its fire-resisting qualities. Thousands of installations have demonstrated its perfect weather-proofing efficiency, its long life and fundamental economy.

Carey Roofing can be applied to the building in the ready-made form, as a uniform, seamless covering, or built up on the job to meet the requirements of complicated structural details.

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Satisfactory Service*

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READY TO SHIP

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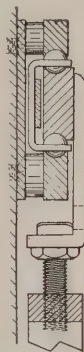
Manufacturers Cleveland, O., U. S. A.



### A SIMPLE, MECHANICAL DEVICE

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*Some Reasons why architects specify  
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So simple, so perfect that repairs are uncalled for. Once installed a door is always in service. Best materials and excellent workmanship make them all but everlasting. But slight increase in original price over the cheaper devices. Low cost of installation. No cost in upkeep.

Hangers Furnished in Both SINGLE and DOUBLE

The Single Hanger

Write for All Facts and Catalog

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It requires no attention—aside from an occasional oiling.

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It is the most perfect pumping equipment known.

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have achieved a reputation during the half century of their existence that entitles them to the high regard in which they are held by architects. They are a "Standard" product. Built to harmonize with any architectural scheme, they add to the beauty of the landscape. Send for our book—"WINDMILLS." Your file is incomplete without it. Send to-day; you will have use for it to-morrow.

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Number Four—A Brick Bungalow to cost \$3,000.

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Number Six—A Hollow Tile House to cost \$6,000.

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Any or all of these books will be sent prepaid upon receipt of price—fifty cents per volume.

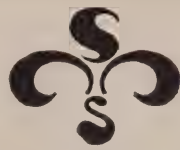
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Architectural Publishers

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slate. 526 holes  
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You have provided the most practical way to remove ashes



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**N**O matter what type or size building you are planning, the ash removal problem deserves your earnest consideration.

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G & G Hoists are made in five different models to meet all requirements.

Model A Hoist, illustrated, is a simple, practical device which enables one man, unaided, to remove any quantity of ashes from cellar to sidewalk quickly and safely. When not in use, hoist telescopes and no part shows above sidewalk.

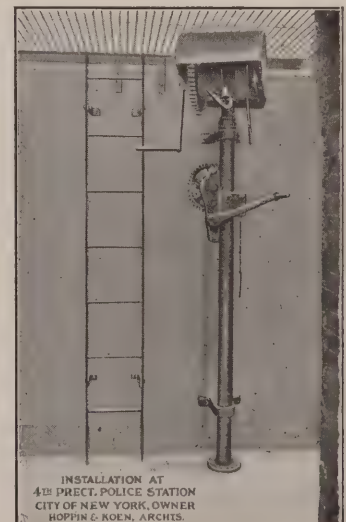
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The logo for the Indiana Limestone Library. It features the word "INDIANA" in a stylized, cursive font above the word "LIMESTONE" in large, bold, block letters. The letters of "LIMESTONE" are filled with various architectural drawings and photographs of limestone buildings. To the left of "LIMESTONE" is a small illustration of the Indiana State Capitol dome. To the right is a small illustration of a large, ornate limestone building. Below the main title, the text "The ARISTOCRAT of BUILDING MATERIALS" is written in a smaller, serif font.

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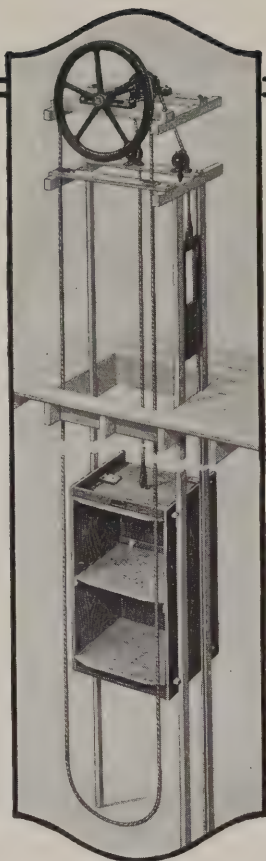
The text of the volume is addressed to the lay reader but nevertheless will be found to contain points of importance to the profession.

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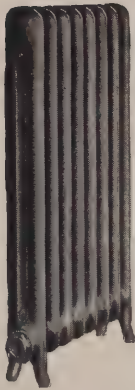
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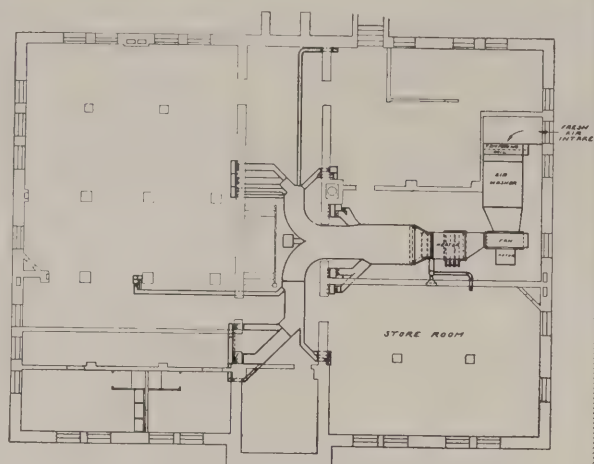
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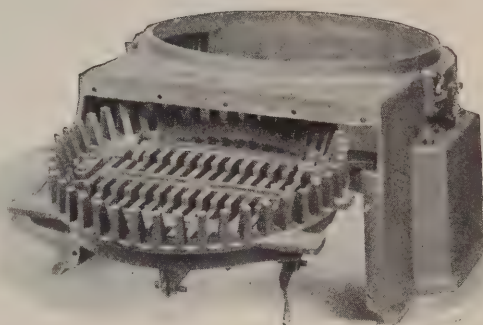
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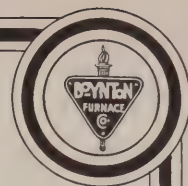
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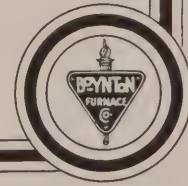
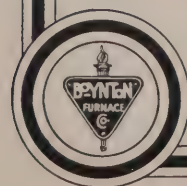
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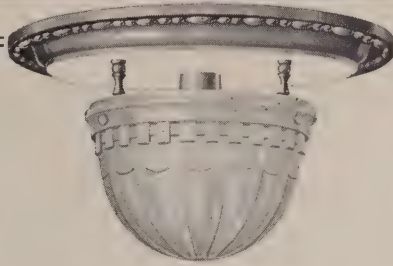
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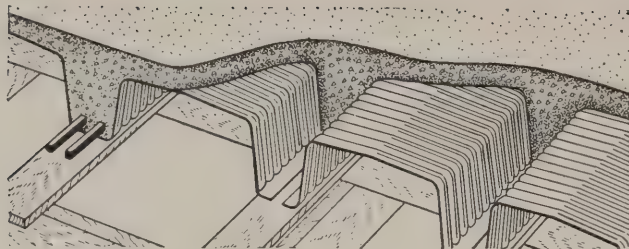
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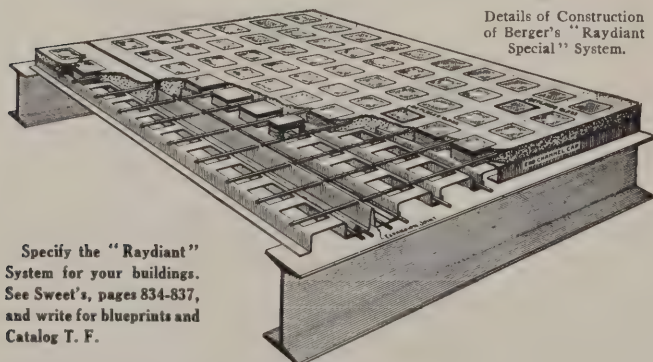
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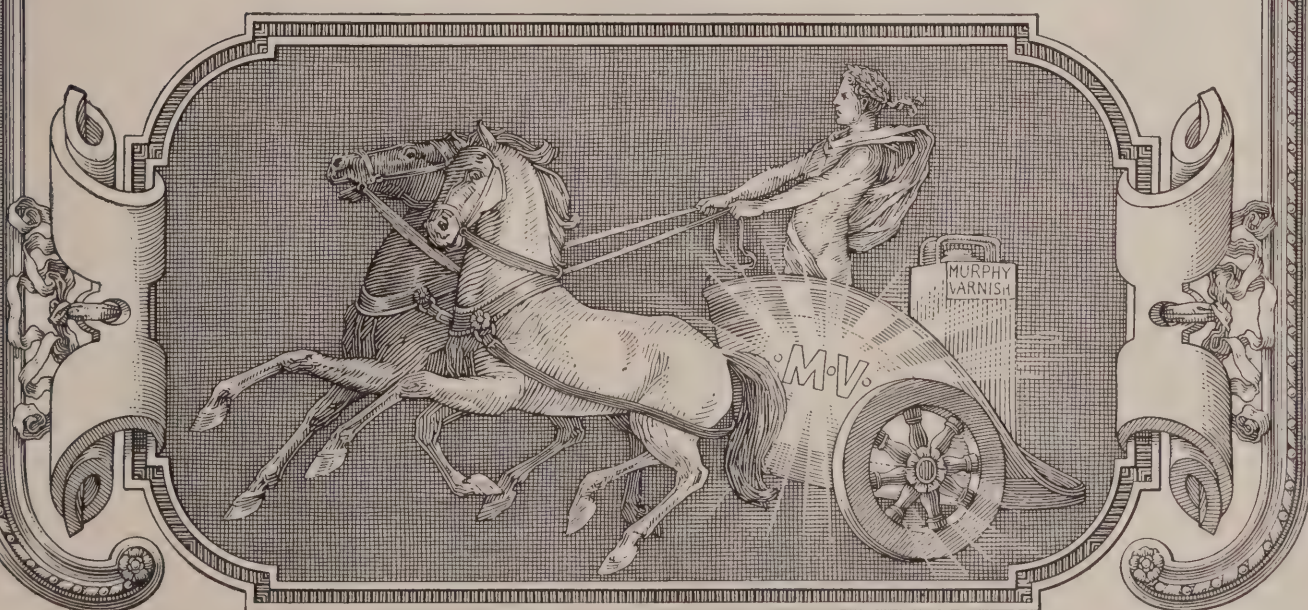
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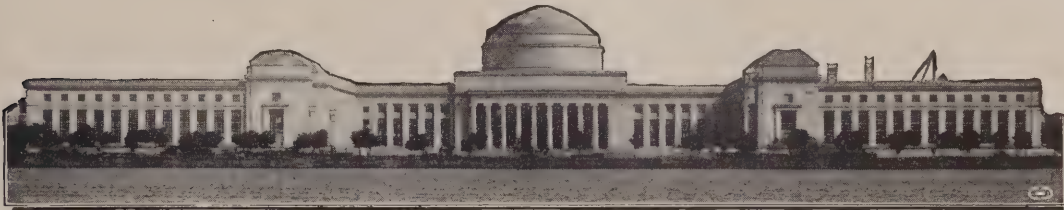
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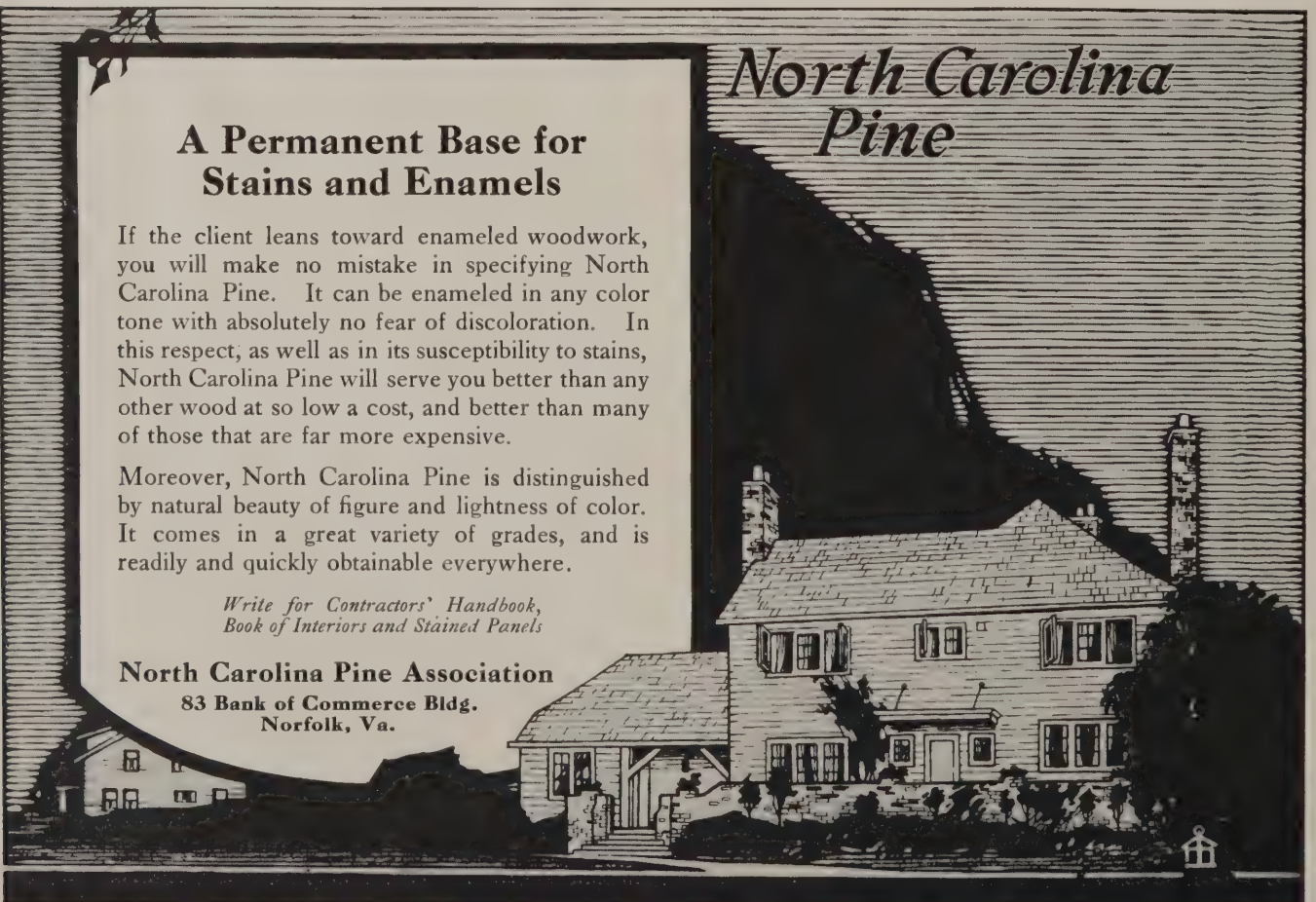
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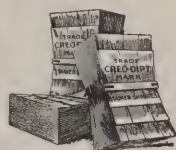
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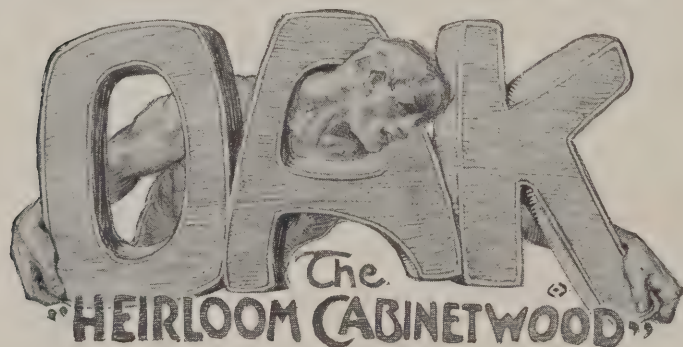
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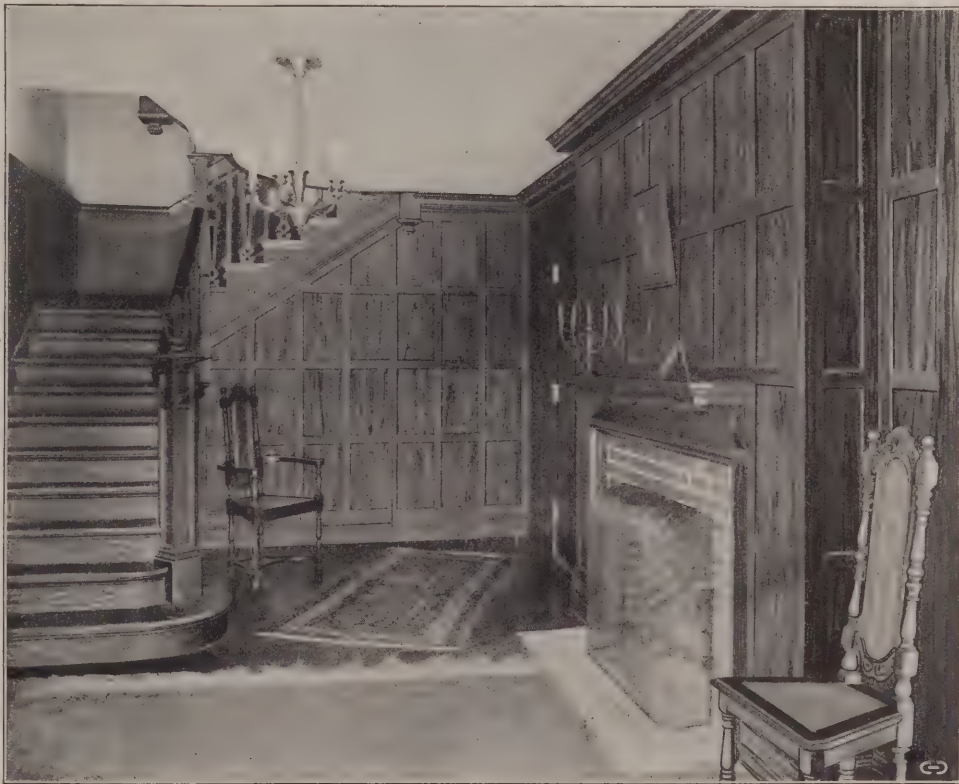




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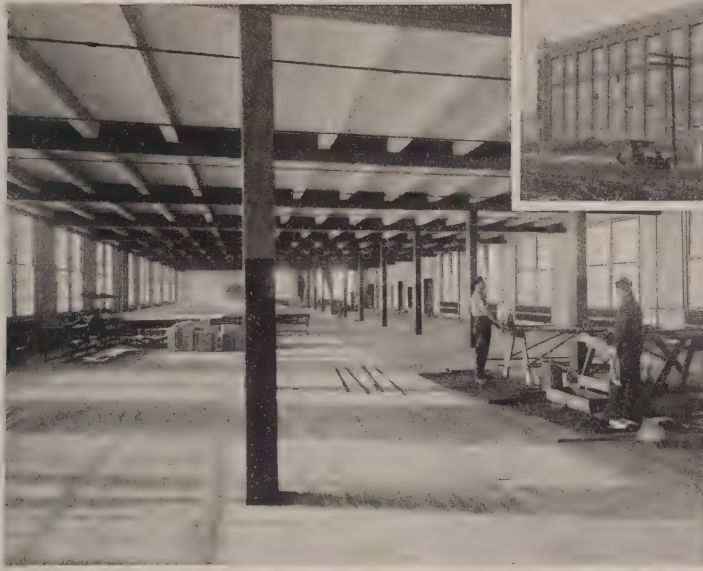
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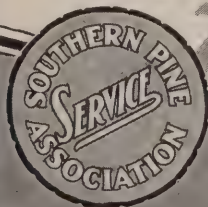
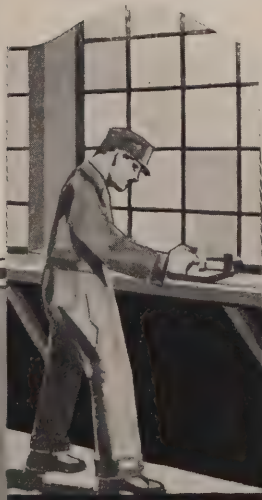
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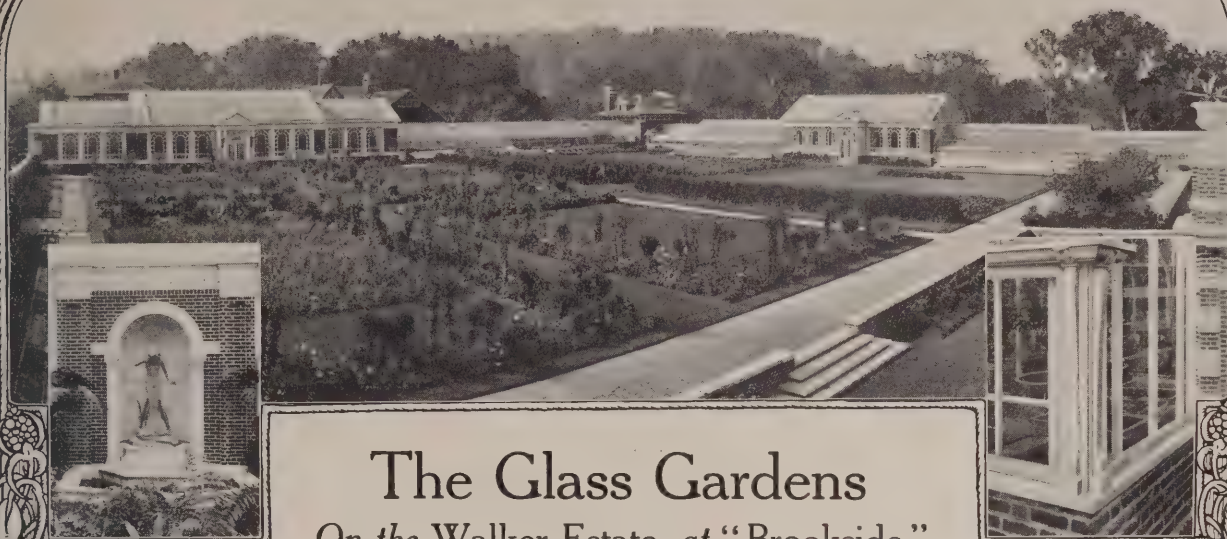
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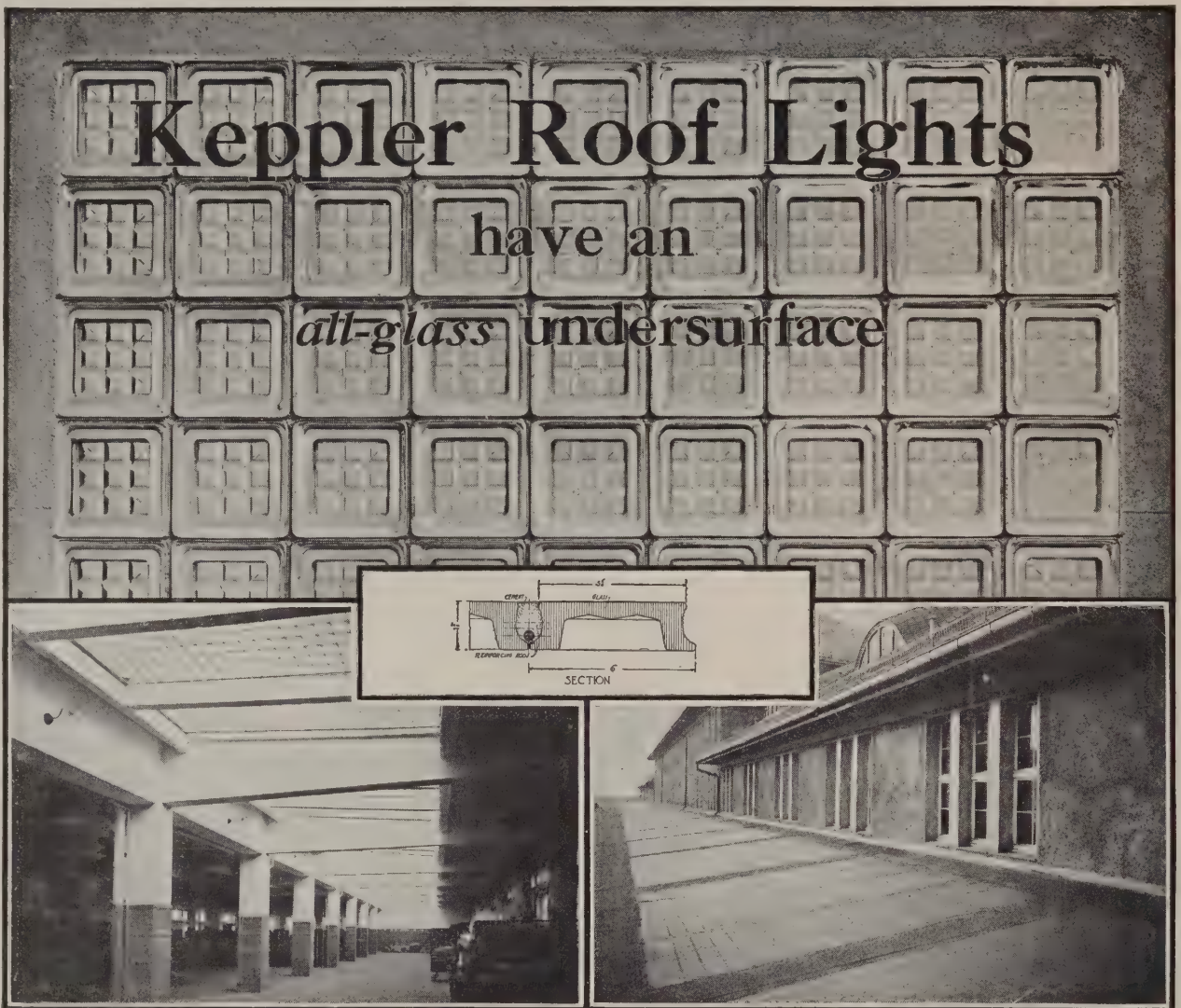
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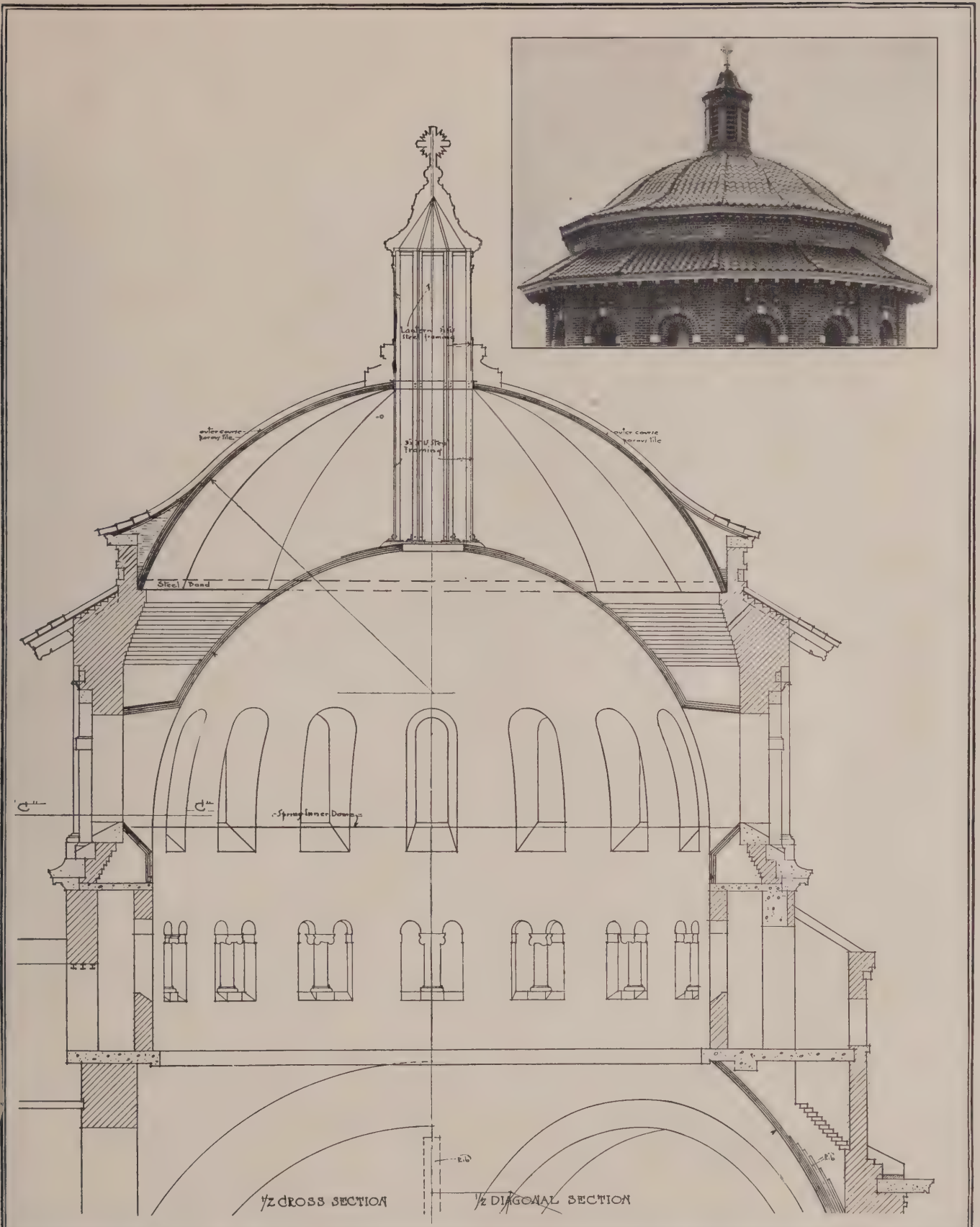
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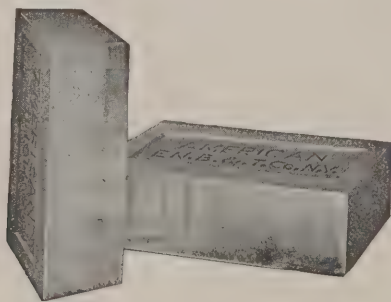
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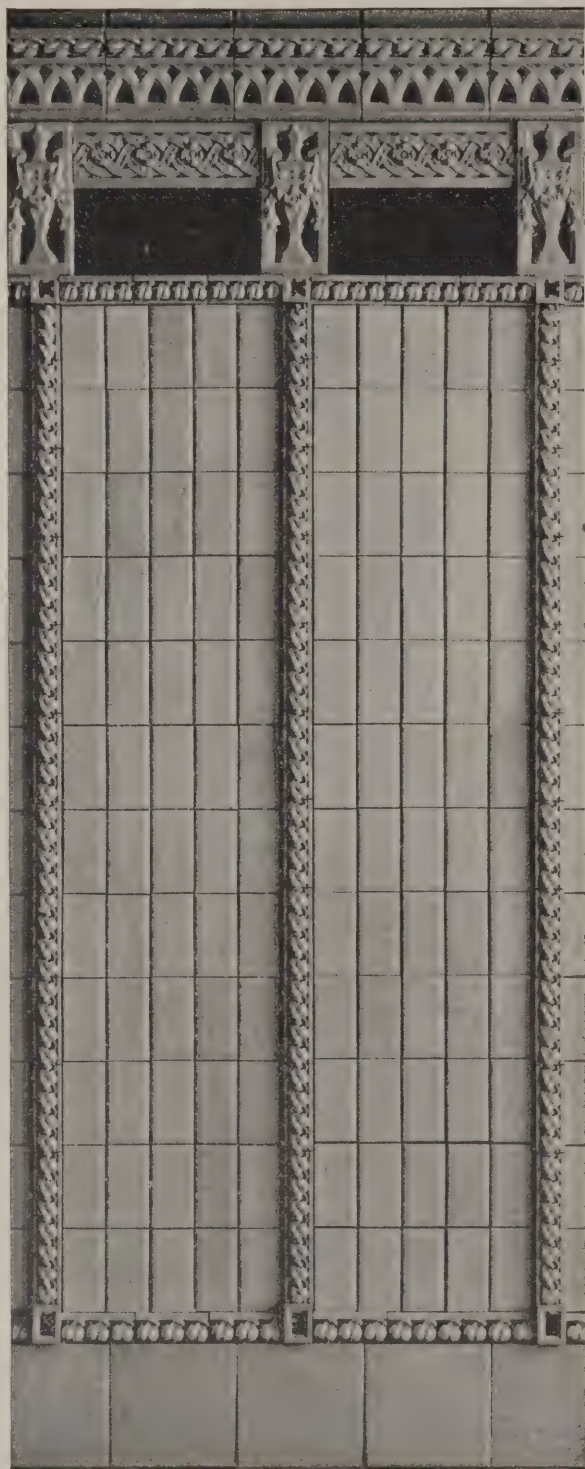
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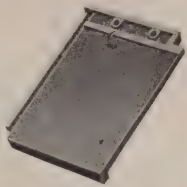
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# THE ARCHITECTURAL FORUM

VOLUME XXVII

NUMBER 2

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AN EARLY XVIII CENTURY PALACE IN SALAMANCA, SPAIN

The facade is quite Italian in character and shows no traces of local Spanish treatment. The front is now marred by the enclosing of the top story loggia



# THE ARCHITECTURAL FORUM

## FOR QUARTER CENTURY THE BRICKBUILDER

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### Catholic Church Architecture

By CHARLES D. MAGINNIS, F.A.I.A.

THE standards of ecclesiastical architecture in America have been for years the object of vivacious criticism. Much of this, though in the main sympathetic,—perhaps because it was sympathetic,—has been harsh criticism. It has not been unjust, but it has occasionally been ungracious. Something may be gained, perhaps, by a straightforward discussion of the principles by which Catholic church art may actually be made better.

That architecture is an art and not merely a mathematical science, is too obvious to need emphasis, and yet, if the Catholic church is to regain its artistic prestige, this must be an active principle. Like literary art, architecture has its canons of taste. They may be more vague to the average perception, but they are perceivable and are entitled to the same measure of consideration. Nevertheless, the most untrained opinion is impatient at the suggestion of authority in matters of architecture. Many who would be timid about a literary judgment will pronounce instant verdict on the design of a cathedral. "I don't know much about architecture, but I know what I like," is familiar hearing. Sometimes modesty speaks in this—usually it is anarchy!

There is instruction in the experience of a professor of architecture who recently judged a group of competitive designs for a Protestant church in a city well known as a musical center. First award was given to a distinguished Gothic design, graceful and reticent, the roof lines delicately terminating in a slender *flèche*, after the French manner. When the decision was proclaimed to the committee, there was a chorus of protest. "I don't perceive the superiority," said one. "Do you mean to tell us," said another, "that this is the best design submitted—this which has no tower, when some of the others have actually two?" And there was much murmuring. "Gentlemen," said the professor, "two towers are not of necessity an artistic merit—they must first be good towers. Those you indicate are,

on the contrary, bad. Sainte-Chapelle, the purest Gothic building in existence, is proof enough that even one may be superfluous." They were still unconvinced. "You need not accept my verdict," continued the professor. "It lies with you finally to decide whether you shall spend \$250,000 for an illiterate piece of architecture which can appeal only to untrained taste. Cultivated opinion is bound to condemn it. Are you so indifferent to such opinion? You have a symphony orchestra in your city which is held in high respect by musical critics throughout the country. The majority of your citizens don't attend its concerts. But is there one of you who is indifferent to its presence? Are not you prouder of your city because of it? Now the same high quality which gives distinction to your musical organization is present in the design I recommend to you. Execute it and you will soon be made conscious that you have a scholarly work of ecclesiastical art in your midst." The principle of authority was perceived and the design was adopted unanimously.

It is clear that, if we are to challenge critical approval of our buildings, we must, instead of interposing merely average taste in the shaping of them, have intellectual standards of architecture. Inferior architecture, moreover, is extravagance. Frequently \$30,000 to six times the sum is spent to provide for a congregation of a thousand people, the physical requirements of divine worship, when less than \$10,000 will provide a habitable covering. Wherefore the generosity? Not for increase of utility, but to secure, as far as the means will admit, a house worthy of its sacred destination. It is desired to have it beautiful and dignified—in other words, artistic. Every cent that is expended beyond \$10,000, then, is expended for art, and for nothing else. If the issue be not art, if the intention be frustrated by ignorant hands, who shall account for the economic waste?

To have art, we must have artists, and by "artists,"—for there is no word more constantly

misapplied — I mean men of unquestioned skill and authority. We must seek the sources of true art production instead of complacently accepting what the highly organized commerce of to-day offers at our doors. For art is not to be had merely by paying for it. To select an architect as one would select a hardware dealer, assuming that one is as good as another, is being simply unintelligent at the critical moment. Neither is it of necessity intelligence to employ him to design a church because he has already designed forty. In the present state of our art it may be quite as safely assumed that he has furnished forty reasons why he should not be entrusted with another. The real test of an architect's ability lies in the judgment of his own profession. If he has gained no eminence there, it is because he has earned none. The belief obtains that the service of those who are thus particularly skilled is expensive service. This ought to be well founded, but it isn't, as the good architect and the bad fare equally. This leads us to the important question of architecture and economics.

Those who are convinced that Catholic church architecture exhibits artistic inferiority, are apt to plead that it is necessitated by the comparative poverty of the Church. It is true the Church is not wealthy nor, for its full beneficence, should it be so. But art may glorify poverty as well as riches. To say that the progress of Christian architecture is hindered by lack of means, is to maintain that there is an essential relation between the value of a work of art and the cost of the material of which it is composed. In one of our leading eastern cities there is a modest little building set almost in the shadow of a grandiose structure representing the expenditure of millions. By the discerning all over the country the humbler one is deemed artistically priceless, the other is execrated. It is not the economic limitation itself, but the abuse of it, which causes mischief. Instead of realizing the truth that a simple brick parish church may be made, in point of architectural quality, better than a cathedral, the financial limitations are supinely accepted as a humiliating and hopeless obstacle. Instead of building modestly when the parish purse is light, more often is it the custom perversely to reach out for pompous types of architecture which cannot be vitalized.

Are not all architects familiar with the Gothic church with the copper clerestory and the wooden pinnacles, in the interior of which the plaster enters into the design not merely as a wall covering, but as a structural material which, springing

jauntily from engaged columns, soars into elaborate vaulting after the manner of old European cathedrals? Yet, of all styles of architecture, the Gothic can least afford to be without structural integrity. And the pity of it is that the expenditure represented in this sort of thing, had it been controlled by good taste, might have given so many examples of good instead of bad architecture. To be really artistic, churches need be neither costly nor elaborate. They should be, on the contrary, more simple, if only they be more thoughtful also. If good art is to be had, the lesson architects must learn from the modest means at their disposal is to make their churches modest, too!

But let us deal with some of the typical problems in the concrete. By discussing, in their order, the buildings of the village church, the town or suburban church, and the city church, we shall develop the chief principles which should govern their design.

*The Village Church.* As a nation we have relatively few villages. We are a gregarious people. Our lesser communities are generally merely big towns in the making. Their life and habit of mind are of the town, for the trolley car is universal, and so is the morning paper, and it is a far corner, indeed, where some subtle influence does not penetrate of the New York of yesterday afternoon. For all this there are many happy communities, by no means remote from cities, which, in the independence of their being and the simplicity of their habit, furnish good reason for some words on the village church. In considering this type only the principles of taste need be discussed.

The best ideal of the village church is derived from our memory of the charming little rustic churches of France and England. And it would assuredly be difficult to imagine a rarer comity between architecture and untrained nature than that exemplified in the little ivy-clad, Gothic churches of some of the English counties. Art could not be less sophisticated. So simple and unconscious are they, so completely are they shorn of the mere ornamenta of Gothic that, were it not for their modest mullioned windows, they could scarcely be classified. Indeed, their charm may almost be said to consist in their independence of mere "style" — in the universal appeal, rather, of their repose and simplicity and their perfect sympathy with their environment.

It is an architectural axiom that the building shall be appropriate not merely to its purpose, but to its surroundings. A structure which may be admirable in the city may not be at all admirable in the country. Why is this? In the city, by



reason of its life, the physical conditions are formal and conventional. Nature is pushed outside the big boundaries. It may not dictate the aspect of things. When there is need that it be engaged it, too, must be formalized. There the trees appear in flanking geometrical lines up the boulevards, the shrubs are pruned and persuaded to mathematical precision, and the grass in the public places is squared, circled, crescented, and octagonized into conventional subordination. Art, not nature, is in control. In the village, however, nature is at the doors. Art, then, becomes the servant, for architecture can furnish forth nothing so beautiful as a rolling green sward and a group of noble trees.

The village church, then, must be picturesque — it owes that to its environment. Who does not know of instances of the selfishness which builds with no thought of what is due to the locality, to the serious injury of a beautiful neighborhood, and the outrage of local patriotism? It should be built, if possible, from materials of the locality. If field stone is to be had, nothing could be better. The ivy will cling to it, and surely there is lovely symbolism in such contact. But even wood may serve, and serve admirably, if it be cased with the shingle, for the clapboard is an abomination! Shingled walls with gables of half-timber and cement may be made an attractive combination of materials. The nature of the structure should be primitively simple. There should be no aping of the forms of ambitious architecture. Such effort is most inartistic and the effect invariably distressing. In the design of the village church nothing could be in worse taste than the introduction of the meaningless pointed vaultings of lath and gaudily tinted plaster. How much finer is the sentiment of that roof whose honest beams reveal their sturdy purpose! It is a sentiment of which there is regrettably too little in our minor Catholic buildings. Indeed, it is usual to associate the naive type of village church with Protestantism — why, I have never been able to understand, for France and Ireland have thousands of such.

*The Town or Suburban Church.* We come now to what may be considered the most typical architectural problem — how to build fittingly for a congregation of a thousand people. Obviously, we must confine ourselves in its discussion to general conditions, since the problem is susceptible of many solutions, depending on the immediate conditions of site, environment, climate, and natural resource.

The first consideration is the plan. The plan

of Catholic parish churches is usually of the basilican type — that is, a longitudinal division into nave and side aisles by means of two rows of columns which occasionally support a clerestory. There is considerable difference of opinion as to the actual adaptability of such organism to our American conditions. What are these conditions? Catholic congregations assemble to the full capacity of the church at given times. The people are assigned to fixed pews. Mass is celebrated at the central altar and a sermon is preached from a point proximate to it. There are here two principles which call for recognition, — the optical and the aural. Now if these, and these only, are the principles to take account of in the shaping of the church, — that all should see and all should hear, — then many additional traditions may be thrown overboard. What is the logic, then, of these principles? All obstructions in the shape of columns and piers are gratuitous inflictions. The sloping floor is vindicated and, with it, the “chunky” auditorium with its theatrical curving seats. An architect once boasted to me of such a solution of the church problem and was not in the least disturbed when it was pointed out to him how much it resembled an opera house. For he had introduced sloping horseshoe galleries that the congregation might be fully *en rapport* with the preacher. Optically and acoustically, this was commendable; but the inclination given to the bodies of the worshipers who occupied the sides of the galleries must have caused them to question whether, after all, there was not some principle which he had somehow overlooked. And, of course, there was — the point of view was simply not Catholic. Worship of God at the altar had been forgotten. This principle is the fundamental one in its demand on the architecture. The lines of the interior must contrive to secure a befitting aspect of solemnity — an atmosphere which shall stimulate religious emotion. The idea of the temple should prevail over every other. These several principles may, however, be reconciled. Indeed, they are not unsatisfactorily reconciled even in the basilican type. If the seating is properly contrived, there is no reason why the presence of the columns should be considered as a serious optical disadvantage. I realize they are often held to be so, as we frequently see them built so thin as to give the entire construction a flimsy and unstable appearance. This is merely to beg a question which presents no great difficulty.

A modification of the basilica offers a solution by which the impressive perspective of the tradi-

tional church may be retained and the congregation fully embraced within the lines of support. This consists simply in placing the two rows of columns within 5 feet or so of the outer walls. The side aisles would then be used solely as passages. Without transepts, however, such a scheme as this is adaptable only for a seating capacity of not more than 800. For when the width of the sitting area between the rows of columns is not definitely restricted, the distance between the side and center aisle otherwise makes for pews of such length that the assembling of the congregation in their seats is attended by considerable confusion. Unless five aisles are provided, which, economically is out of the question, the effective width of the sitting area, including the center aisle, is at the utmost 45 feet, allowing even as many as seven sittings in a given pew.

To accommodate more than 800 on such a system of plan would mean a church immoderately long so that people in the rear would be greatly at a disadvantage. The idea of the transept occurs. Now transepts of historic type are expensive architectural features, especially when considered relatively with the limited number of effective sittings they permit. Here, however, they apply admirably. By making them comparatively shallow, so that they each accommodate only a single bank of pews from which every seat commands a view of the altar, the direct communication with a single aisle makes for the utmost economy. There is no need, moreover, for expressing these transepts externally with loftiness and proportionate expense. They may be carried up to the height of the aisle roof only, or terminated by gables whose bases are related to that level.

A few words should be said concerning the sanctuary. This is generally given too slight an emphasis on the plan, being often little more than a large recess. A deep chancel contributes so sensibly, so definitely, to the devotional effect of the church that it is impossible to contrive any appreciable measure of such effect without it. In this interest the edict of Pope Pius X on the subject of church music is most fortunate. Already its effect is to be noted in the more dignified sanctuaries of some of our recent churches, and their provision for choirs. Besides being marked by greater depth, the chancel, as to its floor, is given more elevation.

In the growing regard for rubrical tradition there is a noticeable feeling for the proper placing of the baptistery. The baptismal font was treated but recently merely as a necessary piece of church furniture, and placed where there happened to

be room for it. It is gradually, however, coming into its sacramental importance in the plan of the church. Rubrically, the baptistery belongs on the Gospel side, near the entrance, to symbolize the beginning of the Christian life. It should, if possible, be a distinct apartment which can be artificially heated. Where baptisms are administered only at such times as the church itself is heated, a grille or open screen may serve to enclose it.

So much for the principles of the plan. We turn now to its artistic expression. A given plan is susceptible of being expressed exteriorly by at least as many different aspects as there are styles of architecture. Of course, to any one who thinks a little about the matter it is anomalous, to the last degree, that we should have to deal with "styles of architecture" at all. To appreciate what a style of architecture ought to mean, we have only to remember that such a system as Gothic was the growth of centuries. Generation after generation was born and passed away and men still looked out on a Gothic world. Not only was the church in which they worshiped a Gothic church, but their dwellings were Gothic and their town halls and their markets. Gothic was as familiar as the oaks which grew in the fields. Children absorbed the spirit of it with their alphabet. To Gothic designers their style was at once a living language and an inherited vernacular. Without a mass of tradition in living language, the Cathedral of Amiens, for instance, could never have existed, for no single intelligence could have conceived it. Such was the evolution of every historic style and, as such, it expressed the genius of the civilization in which it developed.

What, then, is meant here in America by the jumble and conflict of styles which are not of us? Have we no language of our own? We seldom ask ourselves the question. Even architects have grown so familiar with the conditions as to lose sight of the anomaly and deal with styles with the caprice of milliners. It all means that, since the invention of steam and electricity, our horizon has been swiftly widening, until now, at breakfast of a morning, we know and are interested in what all the world did yesterday. National and racial identities are growing more and more indefinite. There is a constant mingling of peoples. Europe and America are a network of railways and the airships are already in the sky. It means, moreover, that the photographic camera has placed at every architect's elbow the pictorial record of all the artistic and inartistic periods from Assyria to Oklahoma. So it is that the art of the time is intensely self-conscious and, of necessity, eclectic.



Our architecture for years to come must continue to be reminiscent. Each style will make its own peculiar appeal, for we must remember we have to deal with a variety of racial temperaments. No one architectural system, however intellectually satisfying, may hope to reconcile such variances, nor will a national style of architecture develop in this country until we are one coherent race, probably not even then. Meantime, social types and architectural types are in the crucible together. In these conditions how may we make intelligent selections?

For the Catholic parish church in America some few historic styles possess unusual adaptability to the materials which we can afford to use. We commonly build in brick to which two of the most admirable styles of Christian architecture graciously lend themselves. I refer to the Gothic and the Italian Byzantine. I do not mean to imply that the Gothic church when rendered in stone is not nobler; much less that a given Gothic design may be reasonably rendered in either material. I mean that, by skilful design, the simpler charms of the style may be caught and held in the brick wall as well as in the stone. There is considerable misunderstanding of the Gothic in this connection, many believing it to be necessarily an expensive style of architecture. This is a mistake which comes of thinking of Gothic as depending for its interest on pinnacles and crockets and elaborate traceries and generally exuberant form. As a matter of fact, it is the most flexible of styles, lending itself to most modest expressions. England abounds with excellent precedents in this kind. And in northern Italy there are remains of a Gothic brick architecture which is full of admirable suggestion for our work here in America. As to the claim which the Gothic style in the abstract makes on our consideration, it need only be said that no other system of architecture ever approached it in the felicity with which, in its full development, it interpreted the genius of the Catholic religion. Since this is true, it is a tradition which ought to be jealously fostered and continued.

The Italian Byzantine connotes a style which is singularly adaptable to the conditions of the American parish. Classic in spirit, it retains much of the stateliness and dignity of the ancient Greek architecture, while it escapes its pagan baldness of sentiment. Indeed, it is essentially a style of color and rich symbolism, as the interior of Monreale Cathedral in Sicily and the churches of Ravenna testify. Its round arch admits of spanning larger spaces than the pointed arch of

the Gothic and, by virtue of this alone, appeals to the favor of many who are temperamentally opposed to the medieval type. In this connection it is interesting to note that the old Celtic ornament may readily be carried into harmonious association with the Byzantine. Bearing upon the practical adaptability of the style to our uses, I may add that its employment may be reconciled with severe economy.

Though these two styles, the Gothic and the Italian Byzantine, have superficially very different characteristics, such features as the clerestory and the tower enter, with both, into the design of the church. A few words may be said of these familiar features. Whether in one style or another, the clerestory must be of masonry; constructed of anything else it becomes a flimsy and meaningless pomposity. There is no feature of our architecture so severely and so properly criticized as this. We should highly resolve to leave the clerestory utterly out of our building if we grudge the money to make it what it ought to be. And it is not artistically indispensable after all. There are extant, in both styles, admirable churches without an inch of clerestory. In the larger type of building we have been discussing, however, either a tower or a clerestory will generally be found necessary to give the structure its churchly individuality. The degree in which the tower may contribute to the impressive effect of the church depends much upon its placing. Commonly, in the Gothic building, it is made to develop out of one side of the façade, but this, unless skilfully managed, results in an uneasy skyline. The Italian method by which the tower is set back toward the chancel is better, as, by this means, perfect symmetry is imparted to the façade and a more interesting perspective to the building. To adopt this arrangement to the Gothic calls for ingenious modification, however, without which the effect might be seriously prejudiced. A very effective expedient is the placing of the tower directly over the chancel, for which, by the by, there is ancient Gothic precedent. Though the proportions of the average chancel, when resolved into the square plan, make for a tower so placed a more than commonly big diameter, this is offset economically by the fact that, for effective height, it needs comparatively little beyond the normal elevation of the sanctuary walls themselves.

*The City Church.* Conditions in our larger American cities are developing an architectural problem which calls for independent solution — the church in the congested district. Instinctively search is made for the corner lot, but the

corner lot in most communities is apt to carry a shrewd price. The church is thus often compelled to be built within the block. The planning of the building in these circumstances, so as to secure good lighting, would be comparatively a simple matter were we dealing with a single auditorium. In this case the aisle walls might be quite solid and placed even on the party line, provided only the clerestory were properly designed for the admission of light. But the problem becomes complicated by a need peculiar to our American cities — the lower or basement church. In the interest of this, the floor of the upper auditorium must be elevated considerably above the street level and, occasionally, areas provided on the sides. This basement church, with its clutter of columns, is generally utilitarian to the last degree, as if the architect had despaired of getting any dignity into it and had relinquished the attempt. With our modern methods of construction there is no reason why architectural distinction may not be given to this portion of the building. By the use of the steel beam no more supports are needed than exist upstairs. And if the terra-cotta tile vault be substituted for the steel beam, there is the increased advantage of a ceiling quite free of the horizontal line.

It is not improbable that the conditions in New York and some others of our very congested cities may eventually lead to such a plan for the city church as will remove it back from the line of the street in the interest of the comprehensive development of the parish property. It is conceivable that the pastor of a "working church" might weigh against the advantage of a façade on the street line not merely its expense, which is considerable, but the high value of a street frontage which might be put to definite economic advantage. One could imagine the rectory, for instance, occupying this position, or parish halls,

after due architectural importance has been given to the approaches to the church. Such an organism as this would be quite susceptible of dignified and appropriate expression.

The church tower in certain districts of the American city has ceased to justify itself. Our civic architecture — thanks to the elevator and the genius of steel — is becoming more and more vertical, so that even the latest apartment house may prove far too lofty a challenge. We would seek long for a more amusing instance of the inadequacy of the ecclesiastical steeple than that afforded by Trinity in lower Broadway, New York, as viewed from the river. Even St. Patrick's, the proudest temple of American Catholics, is year by year surrendering its influence over the skyline of Manhattan. A tower is designed to be a dominating accent; when it cannot dominate, it is a pathetic thing, symbolizing nothing effectively but defeat and failure.

It is enough if the discussion of these various problems has shown how necessary it is that fresh thought be brought to their consideration. The number of architects is sensibly increasing who have the skill and the artistic conscience for real accomplishment and, no less happily, there are growing evidences of distinguished interest and co-operation in the hierarchy and the clergy. The principle cannot be escaped that the artistic position of the Catholic church is absolutely a matter of its own election. Art must be had, whether it be good or bad, for art is the very breath of Catholic life. The Catholic imagination is vindicated or compromised by the aspect of even the humblest of Catholic structures. And this being so, we may well hope that the Church will finally perceive the value in this material age of such an architecture as will symbolize in a thoughtful, scholarly, and therefore beautiful way the sacred traditions and mysteries of Catholic faith.

Notre Dame  
Academy and Convent  
From the Fenway  
Boston, Mass.



Maginnis & Walsh  
Architects



# The Motion Picture Theater

## III. CONSTRUCTION OF BOOTH AND ORGAN CHAMBER

By CHARLES A. WHITTEMORE

A DISCUSSION of motion picture theaters would not be complete if confined to the limits of structural elements and sight-line layouts. There are several very important considerations which operate in making the investment a success or a failure after the building has been constructed, even along ideal lines.

The heart of the motion picture theater is, of course, in the booth, and unless this be properly constructed and arranged and equipped with the right type of machines, the success of the theater is seriously jeopardized.

In order to give a comprehensive idea of the requirements in this respect, a detailed analysis of the motion picture booth construction and equipment will be well worth while; but for the sake of confining the analysis to the most general type of booth, the three-machine booth will be the only one considered.

The difference between the three-machine booth and the two-machine booth lies solely, as may be readily judged, in the number of machines installed. A two-machine booth has one motion picture projector and one stereopticon, while a three-machine equipment includes an additional motion picture projector. Some booths have only a single motion picture machine with an adjustable "head," which may be released and pushed to one side and a stereopticon head adjusted on the same bed plate in front of the arc light aperture. This is the simplest type of booth and is used only in small or country theaters. The standard equipment for those of large seating capacity where picture projection is carried on in a large way is two motion picture machines and a stereopticon. The machines are arranged side by side with space allowed between them for the operator to occupy during the run of the film.

In many states the dimensions of these booths are fixed by law. A three-machine booth must be not less than 8 feet from front to back and 12 feet wide by 7 feet high. Fig. 1 shows the plan of such a booth, and Fig. 2 shows the inside elevation of the front wall toward the auditorium, indicating the openings for the various machines.

These machines, as have been previously noted, are connected by a lever arm which controls their shutters so that when one machine is in operation the light shutter is closed on the adjoining machine, and when the end of the film is reached, if

the picture on the adjoining film is a continuation of that just previously projected, a single movement of this lever will close the shutter and open the one on the second machine, allowing the projection of the picture to continue with scarcely a break in continuity. This feature saves time not only on the part of the operator and the public, but also for the manager of the theater. Many patrons of the "movies" have noticed the terrific speed of objects moving in the picture. Sometimes, as in the case of motor cars, etc., the speed is not forced. Frequently, however, it is due to the fact that the operator, in order to hasten the program, accelerates the projection and the action in the picture is far more rapid than the actual speed at which the picture was taken. When business is "coming good," the films are frequently "speeded up" so as to get one additional performance if possible during the play hours.

There are two types of machines in common use: one, the hand driven type and the other the motor driven. The hand driven type, as its name implies, is operated entirely by hand, and the operator must continuously turn a wheel which is geared in such a manner as to operate the machine at the proper rate of speed. This necessitates continual attention on his part and in case of any accident in the booth means that the operator cannot leave his machine without seriously interfering with the picture. It is almost impossible except for well experienced operators to use a hand machine and get the best results. Variations in the speed of turning are quickly shown on the screen and the picture becomes "jerky" and lacks precision of motion. The motor driven machine obviously overcomes this defect. As a result this type of machine is being rapidly displaced in all except the small, out-of-town theaters.

The law requires that operators shall be near the machines at all times. With a hand machine this is compulsory, but where a motor drive is used the operator may leave his machine to attend to other duties in the machine room without in the least affecting the picture. In many states it is also required that a licensed operator and an assistant shall be in the booth during all of the performance.

In addition to the machines each booth is equipped with a bench which is called a "rewind"

bench, where films are rewound after being taken from the machine. There are two magazines for each machine—one above the lens and one below the bed plate. The upper magazine holds the film to be projected and from this the film is "threaded" through the "spockets," "take up," "film gate," etc., to the lower magazine. During the process of projection the film unwinds from the upper magazine and winds on a spindle or reel in the lower. This causes the reversal of the film and necessitates the "rewind." The

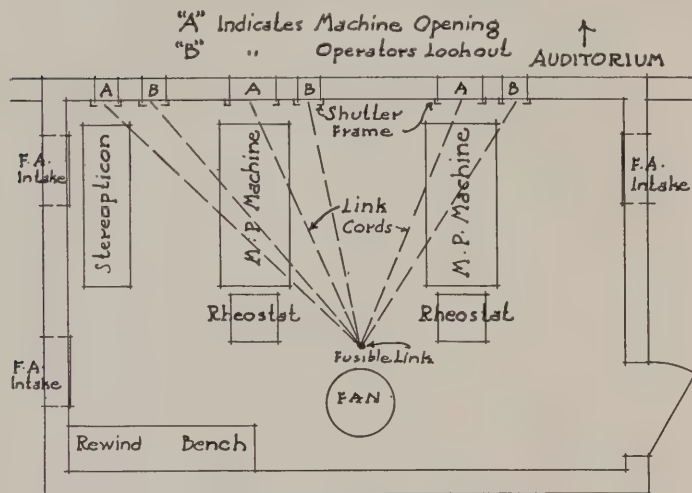


Fig. 1. Floor Plan of Motion Picture Booth

films when received at the theater are right side out, that is, they may be threaded into the machine and projection started immediately; but in the more common type of machines the films, after being "run through," are reversed so that the last portion of the film is on the outside. Consequently before the films can be returned to the leasing agent or projected again they must be rewound and for this purpose, as well as for general repair work, the bench is installed.

There is a type of machine on the market, however, which has attained more or less success, which winds the film right side out, that is, the winding is done from the center of the reel so that after the picture has been run through the machine it is in position to be projected without rewinding.

The machines of the motion picture booth are continually the subject of study to the end that improvements may be made not only in the mechanical part of the machine itself, but also in the clearness of the picture, the automatic focusing, and film threading and shutter devices. The arc light which is the source of light in all of the electric projection machines has also been very carefully investigated, and instead of the old angular arc where the two carbons were set at an angle of

possibly 120 degrees, a new lamp has been perfected in which one carbon is vertical and the other horizontal. The claim is made that this produces an intense light of greater candle power at a lower operating cost than any other form.

The operating cost is one of the principal items that enters into the administration of a motion picture theater, and anything which can be done to reduce this factor tends toward a greater value from the investment standpoint.

The source of light in all of the modern houses is, of course, electrical energy, and in many of the large cities this takes the form of what is called direct current, while in suburban theaters and in more remote districts the current is alternating. There is a radical difference between the effect of these two kinds of current in producing an arc for motion picture projection, and wherever alternating current is found it is necessary to use some device to change it into direct current before being delivered to the carbons.

The two principal ways for accomplishing this are by means of transformers and motor generator sets. In the first the transformer may be of the same general type as other electrical transformers, and is sometimes called a rectifier or transformer.

The motor generator set, as its name implies, is really a unit in which the motor is run by alternating current and operates a generator delivering direct current. These machines are very simple in construction, need few repairs, and are relatively inexpensive to maintain.

On account of the electric arc used in the projection machine and the motors used to drive the machines, the temperature of the machine booth has a tendency to be excessively high, and for this reason the ventilation must be carefully considered.

The regulations usually require a definite size of fan for a definite quantity of air removed per minute, as well as a definite amount of fresh air inlet. The ventilating apparatus, in addition to maintaining livable conditions in the booth, also serves the purpose, in case of fire, of operating to remove the smoke and gases from the booth directly out of doors so that a film might be entirely consumed without the audience being alarmed.

The ventilation system should be connected directly to the outer air both for the supply and for the exhaust, and the latter should be placed at the ceiling, while the supply openings should be as close to the floor as possible. This is contrary to some theories of ventilation, but has been



demonstrated repeatedly to be the correct method for location of the various elements of the ventilation system for a booth.

A separate duct system with openings over each machine should also be installed to take the excess heat and gases from the arc light itself. This may be connected beyond the fan into the main vent duct from the booth, but in such a manner as to prevent a reverse current of air blowing on the arc.

The apertures through which the projection is thrown and through which the operators watch the pictures are required to be covered with glass. This is to prevent smoke in the booth from being communicated to the auditorium with the attendant possibility of a panic. Consequently the booth which has all apertures closed in this manner must have a greater supply of fresh air brought in near the floor and as close to the front of the machines as possible in order to make up for what ventilation might be obtained were the apertures left open. The apertures are also protected by automatic shutters which, as in the case of the glass, serve as an additional fire protection. The shutters are made of metal or asbestos board edged with metal and arranged to slide in a metal groove. To the top of each shutter is attached an eyelet which in turn is connected by a piece of cord to a fusible link. All the cords from the shutter are brought to a central point in the booth and there fastened to a single link, one end of which is held by a hook. In case of fire the link would melt, releasing the cords, and the shutters would close. The link may also be lifted from the hook by hand and the shutters dropped in place. Fig. 1 and Fig. 2 show this arrangement of shutters and control cords.

The general construction of a booth in a second class building is of steel and asbestos. The authorities have standardized requirements for such installations. The asbestos is bolted to the steel framework of walls, floor, and ceiling, while the outside finish on the auditorium side may be at the option of the owner.

In a first class building the booth may be constructed of fireproof material with asbestos and steel omitted. At times the demands of the authorities in regard to booth construction have seemed exceedingly rigorous; but in view of the fact that practically the only source of danger is in the booth, the demands cannot be considered excessive if they tend toward increased safety of the patrons. Quite recently a fire occurred in a well protected booth and over 8000 feet of film burned without the audience realizing that any

accident had occurred. Compare this with the numerous fires and panics in the earlier days of motion picture theaters and the relative value of the new type of booth construction is easily established.

The control of the lighting of the house is another problem which confronts every motion picture theater manager and it has been solved in a variety of ways. If the theater be one in which a complete stage and full equipment is installed with a regulation stage switchboard, the problem is a little more difficult than in the case of a picture house with a small stage devoted exclusively to pictures or songs. The fully equipped theater, when operating vaudeville sketches or acts of any character, must retain the control of the house lighting at the stage board. The ceiling lights, wall brackets, etc., must be arranged so that they may be dimmed, put out, or let on at just the proper time in connection with the act. The picture operator, on the other hand, must have under his control the lighting of the house so that if an accident should happen to the film while the house is dark, he can immediately throw on all lights and thus eliminate the possibility of trouble.

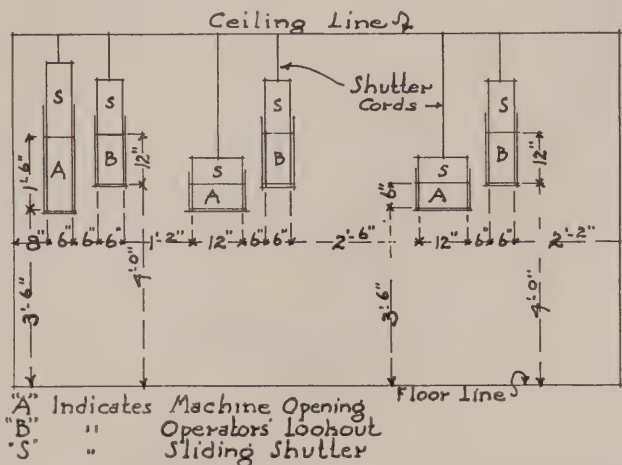


Fig. 2. Inside Elevation of Wall in Motion Picture Booth toward Auditorium

The problem, therefore, is to give instantaneous and complete control of the lighting of the house from two points, and the solution of the problem varies in different theaters. Some managers prefer to have the main switches and the dimmers on the house lights located at or near the booth, while others prefer to have them located on the stage switchboard.

In order to obtain the control from two separate points, the type of switch known as the "solenoid" must be adopted. In this case a push button on the stage switchboard and a push button in the

booth can be arranged to operate the same circuit without possibility of interference.

The emergency lighting of a theater, that is, the lighting of stairs, lobby, and corridors, and a few lights throughout the house, must also be controlled from the booth and the stage switchboard.

Illumination, furthermore, bears an important relation to the success of picture projection. When motion pictures were originally produced, the thought prevailed that the house must be absolutely dark or else the picture would be ineffective. But this idea has long since passed away and the ideally lighted motion picture house to-day is one in which the audience, at any time, can see sufficiently well to read a program and at the same time be able to see a perfectly clear, distinct picture. To accomplish this the placing of the lighting outlets is of first importance. No light rays from illuminating sources should be allowed to cross the zone of light from the picture machine nor to shine directly on the screen.

In some theaters the system of concealed lighting is used, but this is relatively expensive, not only through first cost, but from the standpoint of maintenance. Other theaters use indirect lights from which the illumination is reflected on to the ceiling or other reflecting surface and is diffused throughout the auditorium. This is a very effective mode of lighting. Others have used the direct system with wall brackets and ceiling fixtures and these, if so arranged and constructed that the direct rays of light do not shine on the picture screen or in the eyes of the audience, produce excellent results.

In every case, however, the system of lighting known as "ushers' lights" must be maintained so as to light satisfactorily all of the aisles throughout. It is also desirable that the illumination should be sufficiently clear so that the ushers may readily see the audience or check up the unoccupied seats. It is also very important that the aisles where steppings occur should be sufficiently well lighted to preclude the possibility of tripping or stumbling by any of the patrons.

One of the most effective ways of accomplishing this result is to have at definite points in the aisles standard reflectors which will throw the light directly on the steps, but not in the eyes of persons walking up the aisles. And in connection with this point it may be well to suggest painting the risers white or some light tone, as this differentiates them from the treads even in semi-darkness.

In controlling the lighting system the ushers' lights are always maintained on the emergency service, so that whenever the stairs, corridors, etc.,

are lighted and permit of egress for the audience, the ushers' lights are also illuminated so as to light all of the aisles and passages leading to the stairs, enabling people to leave the auditorium without difficulty. This emergency service should be a double system controlled by a double throw switch which is fed, if possible, from two separate and distinct sources, — from a private plant and a local lighting company or from the local lighting company's mains on two different sub-lines. The object of this is, that in case the service from one plant should fail the double throw switch may immediately be reversed and the other service employed, maintaining the illumination as before.

This emergency service is frequently connected by means of remote control switches in different parts of the house, as, for instance, at the rear of the orchestra floor and the rear of the balcony, in the ticket booth, and from one switch located near the ticket taker. Such an arrangement would immediately permit the operation of the double throw from any of these points in the house in case of defective service.

The stage lighting is relatively the same as in a theater that is fully equipped, although where there is only a small stage devoted exclusively to pictures, the light consists only of the proscenium strips, the footlights, and an overhead source. These lights sufficiently illuminate the stage so as to make it attractive when the audience is assembling for the performance and also at the end of the performance when the general house lights are thrown on. Dimmers on the proscenium strips and the footlights are valuable although not necessary. The effect is much more pleasant if the lights are gradually dimmed than if they are cut off suddenly.

Another feature of considerable importance, which helps materially to make or mar the picture, is the surface on which the picture is projected, called the "screen." In a house equipped entirely for motion pictures, this screen is simpler of construction than in a theater where full performances are given. In the former case the screen is usually located a short distance from the face of the proscenium and is on the back wall of the stage, the stage being approximately 15 feet deep. In the latter case the stage is usually 32 to 40 feet deep, which precludes the possibility of using the back wall as the reflecting surface, and consequently the screen must be hung from the grid-iron at a fixed distance from the curtain line and arranged for readily raising or lowering.

In the theater which is distinctly devoted to motion pictures the screen is usually one of two



types—either a particularly hard, smooth plastered surface or a specially constructed screen applied directly to the wall. This latter type includes what is known as the “gold fiber” screen and the “deformed” screen. The gold fiber screen has metallic fibers woven into the cloth and is mounted on a strong frame with the material stretched very tightly to eliminate the possibility of wrinkles and is usually painted with aluminum paint. This forms a very pleasing reflecting surface and gives good color value to the picture, and in this respect is even better than the plastered wall unless the plastered surface is painted in similar manner. The “deformed” screen is a special screen designed for theaters where the width is unusually great and is made of a hard reflecting material in the form of a wide radius curve. The theory involved is that the people on the extreme sides of the house and well toward the front would on a flat screen have a very distorted picture, while on a screen of this character the picture is normal from all points of view.

In some of the fully equipped stages the screen is made of rigid material, such as plaster on metal lath in a strong frame, while in others it is frequently of a woven cloth. This latter construction is not quite so desirable unless the material is stretched tightly on a rigid form, because of air currents on the stage, which would produce motion and mar the effect of the picture.

In the last few years a new element has entered into theater construction which demands careful consideration, as well as some of the points which have previously been discussed, and this element is the pipe organ. Very few theaters are now constructed without an organ of some character. The music seems to appeal to the patrons far more than the music of an orchestra, except in the case of very large theaters.

These organs are of two types: one is the regular church organ type to which may be added the accessories, such as drums, whistles, etc.; and the other is the type embodying pipe organ features and also containing a piano, so that the shift can be immediately made from organ to piano music without the operator leaving the bench.

The second type is usually a unit complete in itself, which may be installed directly in the orchestra pit. The principal consideration in connection with this installation is that the depth of the orchestra pit shall be so arranged that the top of the organ itself shall not project above the stage and also that the distance of the organ from the front of the stage shall be such that the player can continually see the picture without undue exertion.

With the pipe organ the conditions are entirely different. This installation necessitates the construction of a special room or chamber in which the pipes, wind chests, etc., may be placed. The console or key desk is placed in the orchestra pit in such a position that the organist may watch the picture at all times, and the connection between the console and the wind chests is made by means of an electric cable. The organ chamber should be carefully constructed and insulated against wide variations in temperature and so arranged that the sound will not be dissipated through portions of the building where it is not desired.

The best type of construction for an organ chamber, where the structural walls are of terra cotta blocks or similar construction, is to apply a  $\frac{7}{8}$ -inch furring strip and over this a layer of deafening quilt or insulating material, which has been demonstrated by tests to possess real value, and outside of this again a layer of  $\frac{7}{8}$ -inch pine sheathing. This same construction applies to the walls and floors and also to the roof, but with the further addition of a two-ply layer of waterproof roofing paper to prevent the possibility of any water leaking in from above.

If the construction is of wood studs, the deafening quilt should be applied to them, and inside of the deafening quilt another row of studs should be erected, but not attached to the regular wall construction in any way. Then on the face of these studs the sheathing should be applied. This will create a condition which will prevent the sound escaping in any direction except through the natural opening provided for this purpose.

These openings always face the auditorium or the stage and under such conditions are usually made more or less decorative in treatment. To secure the best results the opening should be covered with a very fine wire mesh or else a very coarse cotton cloth tacked securely to the finished work of the openings and painted as may be desired in accordance with the color scheme of the auditorium. This serves not only as a protection from the larger particles of dust, etc., but also prevents the possibility of the audience looking into the organ chamber where the mechanism is not particularly attractive.

It is difficult to say what new features may be added to the development of the motion picture in the next few years, but certainly the introduction of the organ in connection with the picture program has done much to arouse a universal interest among the class of people who are not fascinated by the “thrillers,” and to raise the tone of the programs by this very fact.



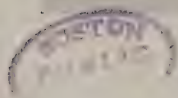


VIEW LOOKING NORTH ON EAST AVENUE



GROUP OF HOUSES ON EAST AVENUE

TWO VIEWS OF REMINGTON HOUSING DEVELOPMENT AT BRIDGEPORT, CONN.





# The Housing of Employees

By ALFRED C. BOSSOM

AS early as 1695 John Bellers, a prominent Quaker, published a pamphlet in London entitled, "Proposals and Husbandry, with Profit for the Rich and Plentiful Living for the Poor, and a Good Education for Youth, which will be an Advantage to the Government by the Increase of the People and their Riches." This old idea has long since passed the experimental stage and is now recognized as an economic, for it is the domestic life and not the factory life that gives the character to a country.

It is a fact that in the same ratio as the power of the great nations of the past developed, so the homes of the poor became more and more unsatisfactory. In the great Reformation movement the houses of the rich took on vast improvements, but the dwellings of the workers became more unhygienic than the huts of the primitive uncivilized tribes.

Considerable agitation and a number of laws were passed in England in the latter half of the last century; but when a royal commission sat to investigate conditions, it was proven that laws alone would not help the habitations of workers, and this same condition prevails to-day. It is the duty of those responsible for the well being of employees to make every effort to raise the standard of living to a level commensurate with the power and wealth of the nation.

Those great purifiers, light and air, which are provided in unlimited quantities, will do untold work unless the perverse ingenuity of man imposes some almost insurmountable obstacle. It is possible for all humans to benefit from ample light and air in their places of work, rest, or play if they are only taught their value.

Profit sharing also has gone beyond the experimental stage and in some form or another is in active operation in many of the large labor employing concerns. Where this sharing takes the form of giving the employee the opportunity of securing a suitable home in a desirable location at a reasonable price, it immediately reacts to the benefit of the employer in promoting greater efficiency among those employed.

In addition to the home with its light and air, two great wants in the lives of wage earners are space and beauty, and these give such tremendous returns in relation to their cost that it is hard to comprehend why they so seldom exist.

In fairness it must be said that all employees do

not live under conditions that are unsatisfactory, but as the great majority of large manufacturing centers have grown up around factories at the instance of the speculator, and without regard to important economic requirements, the percentage whose living conditions are good is exceedingly small. Even in the few instances where ideal conditions may be said to exist, it can readily be shown that at least one family in ten is overcrowded. No manufacturer who is endeavoring to produce the best possible results would consider allowing the operatives to work in badly lighted, unsanitary, or avoidable unsatisfactory conditions, irrespective of compulsory legal requirements to do otherwise. The average working day is eight hours and during the remaining sixteen the worker is often compelled by circumstances that could easily be remedied to live under conditions that tend to place his working efficiency at the lowest possible level. New comers in any section if they are going to be assimilated must be brought up to the desired standard during the sixteen hours outside the shop. A new operative obtaining employment in a new location is compelled to take any accommodation available, and if this is bad he will remove quickly, causing loss to himself and to the employer, or correspondingly lower the standard.

A man not getting refreshing sleep, worrying about his home affairs, or compelled to pass the greater portion of his time amid long, monotonous rows of dreary shacks — without a blade of grass or a green tree, and often where even paint is a thing of long ago — cannot be expected to have initiative or be able to produce the same result as a man not so handicapped, aside from the injurious mental, moral, and health effects.

Utopia is not to be found nor is the millennium to be suddenly produced; but it is within the power of almost all large employers of labor, and with benefit to themselves, to look into the way their people are living the two-thirds of their lives spent outside the workshop. We conserve our coal and forests, in fact all natural resources, and yet hardly any effort is made to conserve the health and mentality of the great majority of the human population.

Better conditions have been promoted in office, loft, and factory buildings than in small residences, for in the former the profit earned from the workers makes it possible for the speculator to receive

a larger return in rent; but in domestic buildings the alcove room without a window is still a favorite with the speculator, and that fire-trap, the "three-decker" tenement house, has outlived its former contemporary, the wooden workroom, by many years.

While the employee is directly under the observation of the employer, he is looked after as carefully as a machine is studied to produce the most satisfactory output. Experience and constructive thought are now teaching that this human being must be also studied and aided during that part of the day when he is not occupied by his work. Satisfactory homes amid desirable surroundings, if unobtainable otherwise, can be provided advantageously by the employer. When this is accomplished, every inducement should be undertaken to make the occupants take pride in their community and get the most benefit from the investment made on their behalf.

Co-operation of this type leads to a more satisfactory understanding between employer and

employee, which makes strikes or lockouts less likely and creates a state of mutual interest. The employer is comparatively assured of a permanent, dependable nucleus of labor in rush times, and the employee is correspondingly assured of a uniform low rent for the best accommodation it is possible to obtain.

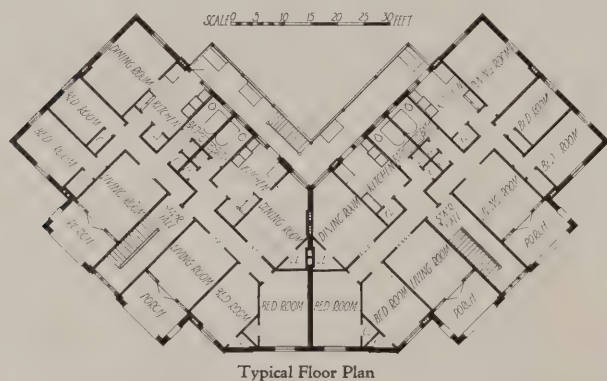
*Various Methods of Providing Accommodation.* The phenomenal growth of industries has in many cases entirely outstripped the normal growth of towns, so that in many places there has arisen the immediate necessity of providing employees dwellings.

In Europe where the building of many workers' communities has been undertaken, the process has been one of gradual development following the growth of the industries, during which period many unforeseen conditions developed necessitating amendments to the scheme instead of following out a fully considered plan from beginning to end, so that foreign experience is of great advantage to America as practically every contingency has been demonstrated and can now be provided for in advance. It formerly seemed an unwritten rule that workers had to be packed side by side in suburban locations, and one on top of the other, without regard to other consideration, but this is now changing.

The actual housing of employees may be accomplished by several methods, such as the use of some old property through renovation and modeling; by individual one and two family houses; by the one family house in rows, not detached; three-story houses with one family over

the other, accommodating as many families as the size of the house and the number of units joined together permit, and the latest type of tenement house. These with their various modifications and special buildings—such as the men's barrack hotels, the children's crèches, dormitories, and recreation homes—cover the possibilities.

The type of house suitable for the West Virginia coal miner differs entirely from the house needed by the highly paid mechanic in a manufacturing town of Ohio; but the underlying fundamentals remain un-



Twelve Family Apartment House, Bridgeport, Conn.  
Alfred C. Bossom, Architect



changed, and with knowledge of the operatives, their scale of wages, hours of labor, and location of the plant and available land, it is not difficult to decide upon the most desirable type of housing to provide.

As a general rule the remodeled property demands the smallest investment and is the least desirable; but where time is an object, or substantial existing houses are available, although not arranged quite as they should be, the addition of a few windows and rearrangement of a few partitions and new sanitary appliances will work wonders in the way of improvement. The disadvantages that this method suffers from are that in practically all cases the original structures are without fire resisting exteriors and, therefore, cannot be considered permanent. They entail a great expense for upkeep due to the continuous use of paint, repair of leaky roofs and windows, and invariably they are closer together than is desirable. If all these defects are remedied, it will usually be found to have been more expensive than starting from the ground up, on land obtained elsewhere.

Under ideal circumstances the compact, conveniently arranged, individual house for one family, in its own small plot of ground, with air and light on all sides, is the best type, and in congested districts the best varies from this down to the three-story tenement house, which gives the cheapest rent where land has much value.

The division of the land naturally varies with the several forms of improvement; for instance, on a property divided into lots 50 by 100 feet, and improved with three-story buildings, not more than between six and seven such units per acre are possible. Thus in this type of improvement a maximum of twenty families to the acre is all that can be considered. In the case of the individual, isolated houses which have garden or playground space, eight to twelve per acre can be installed; but if the land is reasonably cheap, as few as four per acre is a more desirable number.

The two family isolated house has the advantage of giving the tenant owner the opportunity of getting an income from the one-half while living in the other, and the addition of one or two rooms for lodgers often makes a house more desirable in spite of being more expensive to the original renter. Single houses in rows are satisfactory, provided the rows are not too long—six to eight houses form the best group. This type has the disadvantage of having no side ground, but is easier to heat, and having party walls, which should run up through the roof, requires only sim-

ple roof arrangements. The individual house is capable of being rented or sold to employees at a comparatively low price.

In all cases the house should, if possible, be set back from the building line and not placed right upon the street. In towns all improvements should occupy both sides of the streets instead of being confined to one side to prevent their being spoiled by a bad development opposite.

The multi-family house should have plenty of space, otherwise the children play in the street at considerable risk to themselves and annoyance to the tenants. Through ventilation, that is, windows on opposite sides of each section in the one occupation, is essential to health.

The form of construction and finish varies not only with the rent that can be paid but also with the geographical location and the character of tenants. For instance, the rent obtained from colored occupants is proportionately higher than from white people, for as a rule they are more destructive, and more upkeep and renovation expense is placed upon the owners.

In some sections of the country open fireplaces are sufficient to provide all the heating necessary, while in others a good, practical heater is indispensable, but in any case suitable coal storage must be arranged.

In places where the proportion of unmarried men is considerable, houses with additional rooms are essential, as these men have to be cared for as lodgers by the married men.

Back alleys should not be introduced as the difficulties of lighting and supervision are as great as main streets, and the corresponding benefits do not justify this expense.

In determining floor area it should be recognized that no living room under any circumstances should be less than 10 feet wide the narrow way, and at least one room in each apartment should have 144 available square feet of floor space. No bedroom should be less than 7½ feet the narrow way and not less than 96 square feet in area. These are the smallest sizes that should be used under any conditions and they should be enlarged wherever it is possible.

All employees' houses should have fireproof exteriors and roofs for permanence of investment, reduction of insurance, and minimum of upkeep. Where more than three families use a common stair, that stair should be fireproof and there should always be two means of exit in case of fire, and these should not be ladders or cable fire escapes. Under no circumstances should a basement be allowed to be used as living quarters,

nor should rubbish be permitted to accumulate there. In all multi-family houses there should be fire stops between each apartment, and winding stairs should not be allowed.

All forms of flimsy construction should be studiously avoided. Ornamental balustrades and all such details which serve no purpose, but create upkeep charges, should be eliminated. Substantial permanent materials known to be as little affected by the weather as possible should be used.

Running water should be provided within the accommodation made for each family and public toilets should never be allowed, no matter how cheap the development. All destructible features, such as doors, windows, cupboards, hardware, plumbing fixtures, etc., should be made of stock patterns so that replacements can be readily and inexpensively made.

Those portions of the construction which come under the heading of equipment, such as gas and electric pipes, water and plumbing pipes, should all be exposed and readily accessible for change and renovation. Inspection eyes are needed at all changes of direction in pipes where there is the slightest possibility of obstruction, and the design should always contemplate the improvement or repair of one portion without the necessity of destruction or replacement of other materials, such as plaster, flooring, etc. Paint where used — and it is one of the large upkeep items — should be the best and should in no case be stinted. Colors should be selected both for wear and appearance and dark ones should be avoided.

The size and division of the windows is of great importance. The actual glass area should never be less than one-twelfth, and preferably one-tenth of the floor area of the room in which it is placed, and not less than a full third of the window should be available for free air passage. Small lights of glass should be adopted both for appearance and cost of replacement. Provision for all furniture must be made in planning, as floor space is naturally limited.

*Financial Arrangements.* There are few progressive employers who at some time or other have not seriously considered an effort to better the housing conditions of their employees, and most of those who have hesitated have done so for one of two reasons. Either the capital could not be spared from the firm's resources or a suitable or satisfactory method of placing the accommodation provided in the hands of those actually requiring the better living quarters was uncertain.

In many communities where the need of hous-

ing facilities is very pressing, and where no one employer is justified in undertaking the entire problem, a comprehensive proposition can be adopted in which a number of employers participate and pro-rata apportion the expense. This arrangement ensures to all the advantages of purchase in the wholesale, and larger developments provide opportunities for more diversified improvements by giving a wider range of accommodations. They are easier of control and define permanently the character of a bigger area, thereby ensuring the continued desirability of the section because if large enough it is comparatively independent of what happens beyond its own limits. The cost of upkeep and supervision correspondingly go down as the number of units or families under one management increases.

Where a development is started in the outskirts of a town, ample land should be acquired. In smaller developments options should be obtained upon land in the vicinity that in other hands could be developed in a manner which might prove objectionable to the enterprise in question. In other words, every safeguard to ensure the permanence of the desirability of everything should be adopted to protect the investment. In financing such a development, the procedure that first comes to mind is for the employer to purchase land and erect a number of suitable houses upon it, paying for everything as contracted for, then renting the same to employees, or selling them on an installment plan. This is the easiest method, but does not offer as much encouragement as if certain modifications were introduced. Where it is undesirable to take the total cost out of the firm's exchequer at one time, a mortgage covering a very large proportion of the cost should be arranged which can be turned over to the employee as his liability when he takes possession of the house. The need of this aid being so obvious and frequent, certain financial institutions have gone exhaustively into the subject and have reduced the proposition under favorable circumstances to a fairly definite program, enabling the owners to get financial assistance along mutually advantageous lines.

The majority of employers do not desire to make a profit from employees' dwellings, and are quite satisfied to earn a fair interest rate on the investment and to obtain the principal return in the added efficiency of the workers and the very largely reduced loss of labor from sickness. In consequence, houses usually can be turned over to the employees at cost, plus fair interest during the time they are paying for their homes.

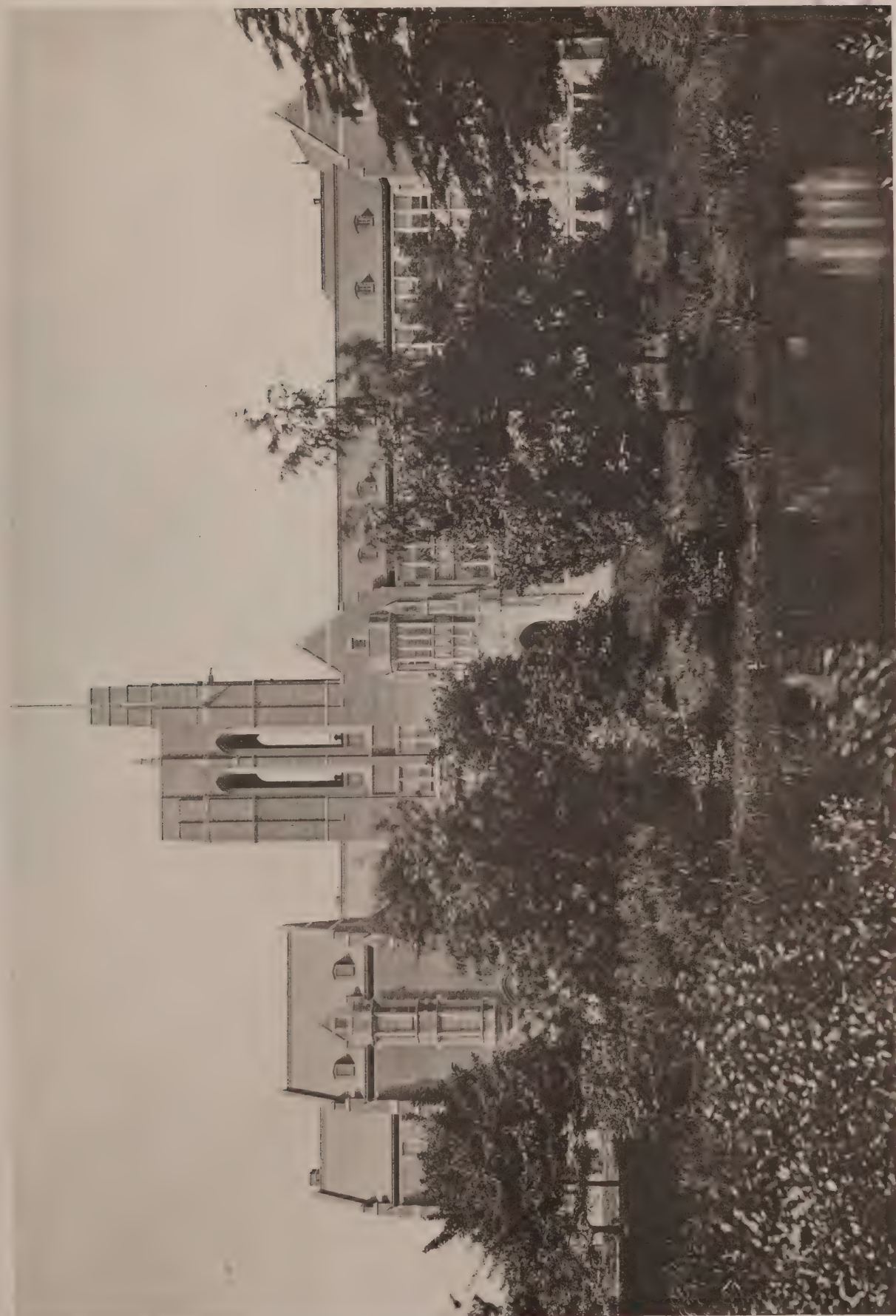




VIEW OF TOWER AND ENTRANCE BAY  
CONVENT AND ACADEMY OF NOTRE DAME, FENWAY, BOSTON, MASS.  
MAGINNIS & WALSH, ARCHITECTS







GENERAL VIEW OF EXTERIOR FROM FENWAY

CONVENT AND ACADEMY OF NOTRE DAME, FENWAY, BOSTON, MASS.  
MAGINNIS & WALSH, ARCHITECTS



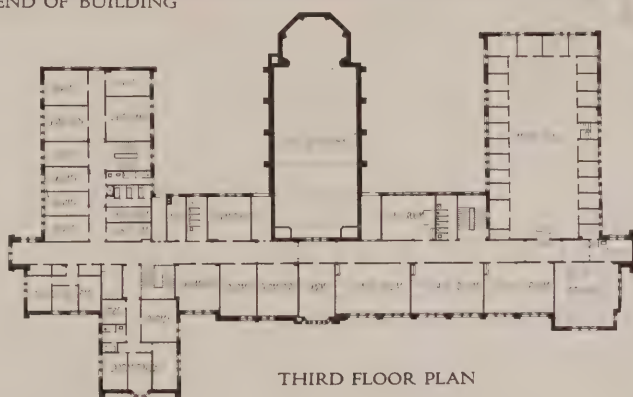




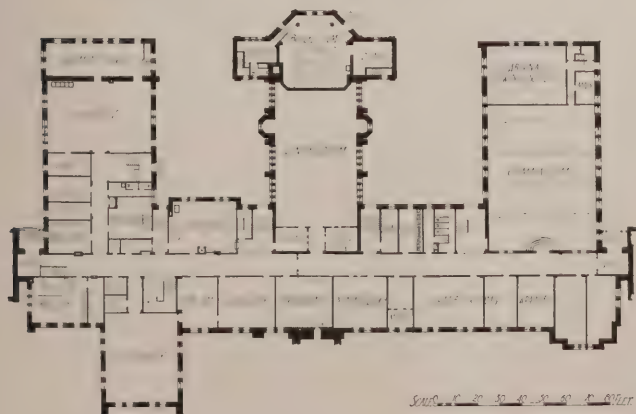
VIEW OF ACADEMY END OF BUILDING



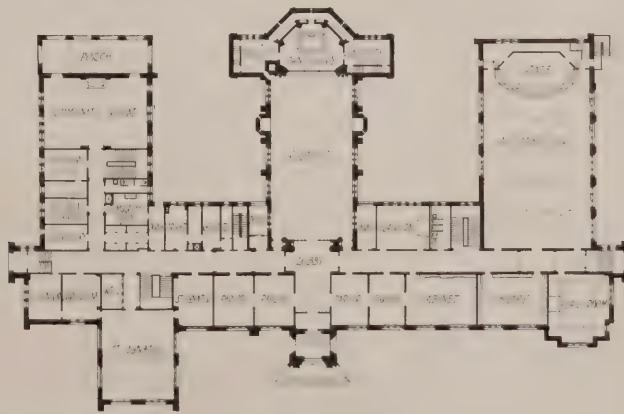
SECOND FLOOR PLAN



THIRD FLOOR PLAN



BASEMENT FLOOR PLAN



FIRST FLOOR PLAN

CONVENT AND ACADEMY OF NOTRE DAME, FENWAY, BOSTON, MASS.

MAGINNIS &amp; WALSH, ARCHITECTS







VIEW FROM THE REAR



DETAIL OF CONVENT END OF FRONT ELEVATION  
CONVENT AND ACADEMY OF NOTRE DAME, FENWAY, BOSTON, MASS.  
MAGINNIS & WALSH, ARCHITECTS







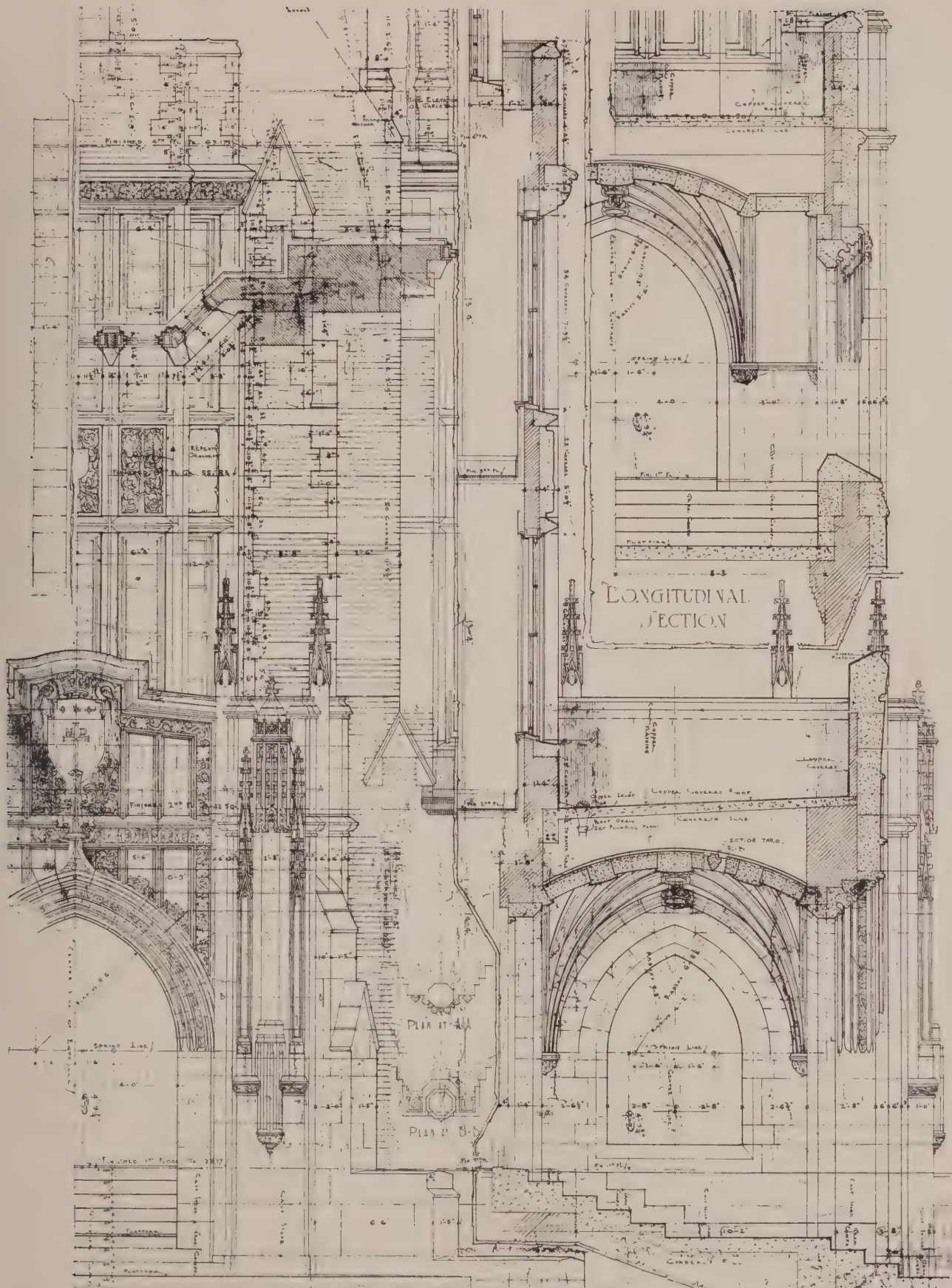
DETAIL OF ENTRANCE PORCH

CONVENT AND ACADEMY OF NOTRE DAME, FENWAY, BOSTON, MASS.

MAGINNIS & WALSH, ARCHITECTS







DETAIL OF ENTRANCE PORCH BAY

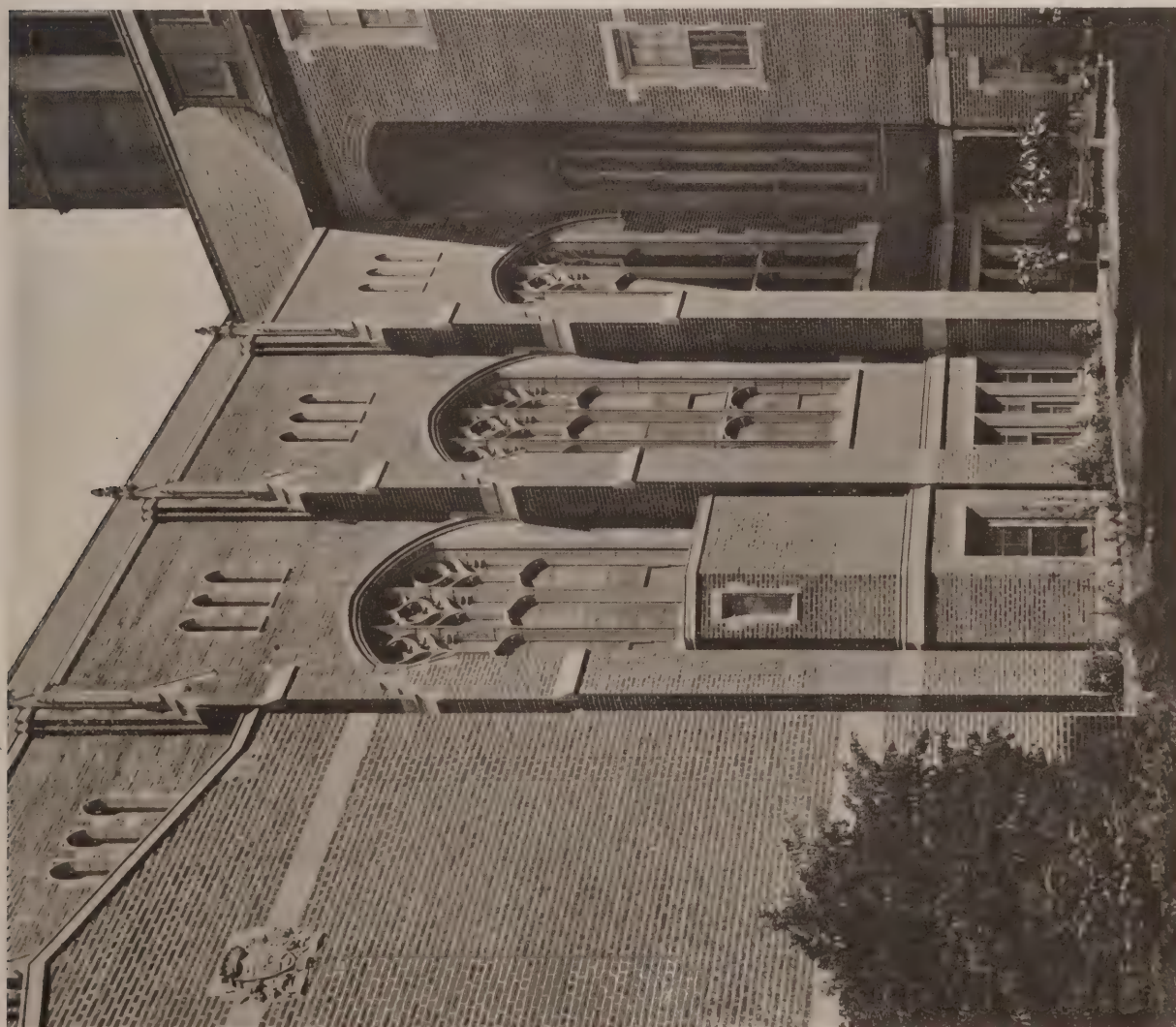
CONVENT AND ACADEMY OF NOTRE DAME, FENWAY, BOSTON, MASS.

MAGINNIS &amp; WALSH, ARCHITECTS





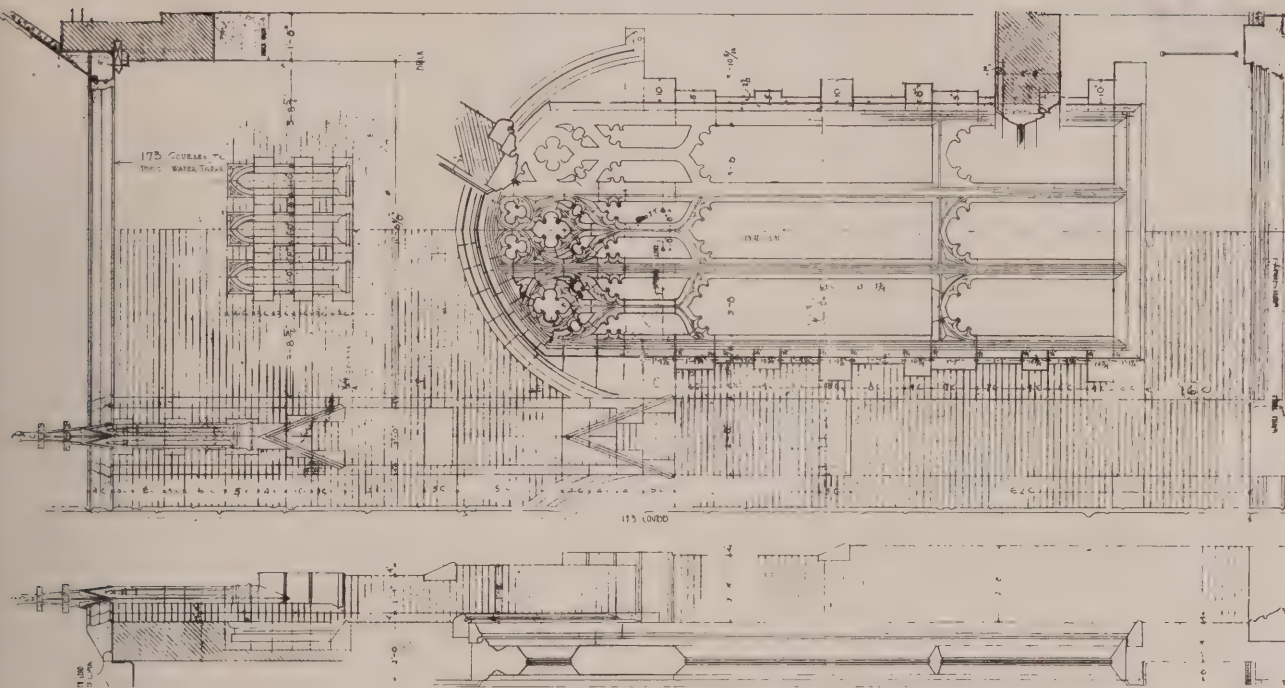
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VIEW IN COURT SHOWING EXTERIOR OF CHAPEL

CONVENT AND ACADEMY OF NOTRE DAME, FENWAY, BOSTON, MASS.

MAGINNIS & WALSH, ARCHITECTS



DETAIL OF CHAPEL BAY AND WINDOW TRACERY







VIEW FROM REAR

ST. BRIGID'S ROMAN CATHOLIC CHURCH, WESTBURY, LONG ISLAND, N. Y.

F. BURRALL HOFFMAN, JR., ARCHITECT







GENERAL VIEW FROM STREET

ST. BRIGID'S ROMAN CATHOLIC CHURCH, WESTBURY, LONG ISLAND, N. Y.

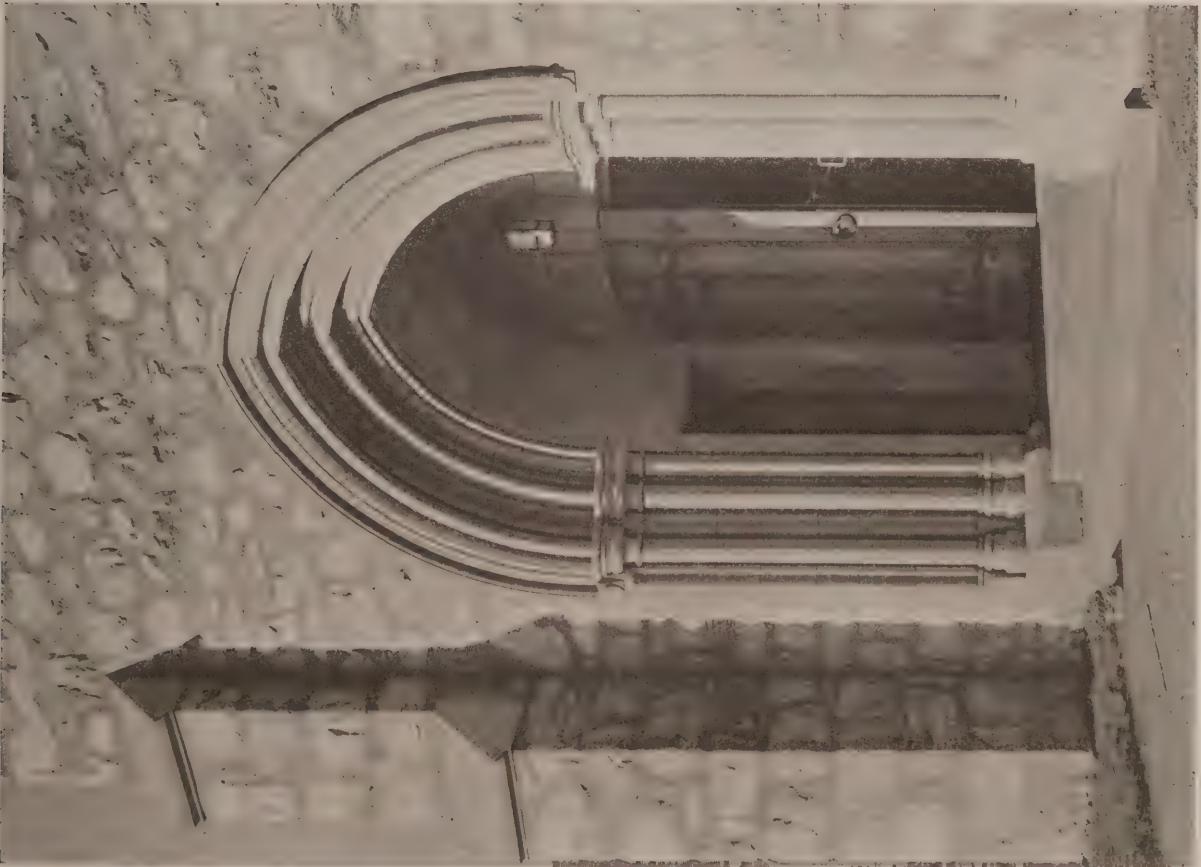
F. BURRALL HOFFMAN, JR., ARCHITECT







DETAIL OF DOORWAY TO SIDE AISLE



SIDE ENTRANCE TO VESTIBULE

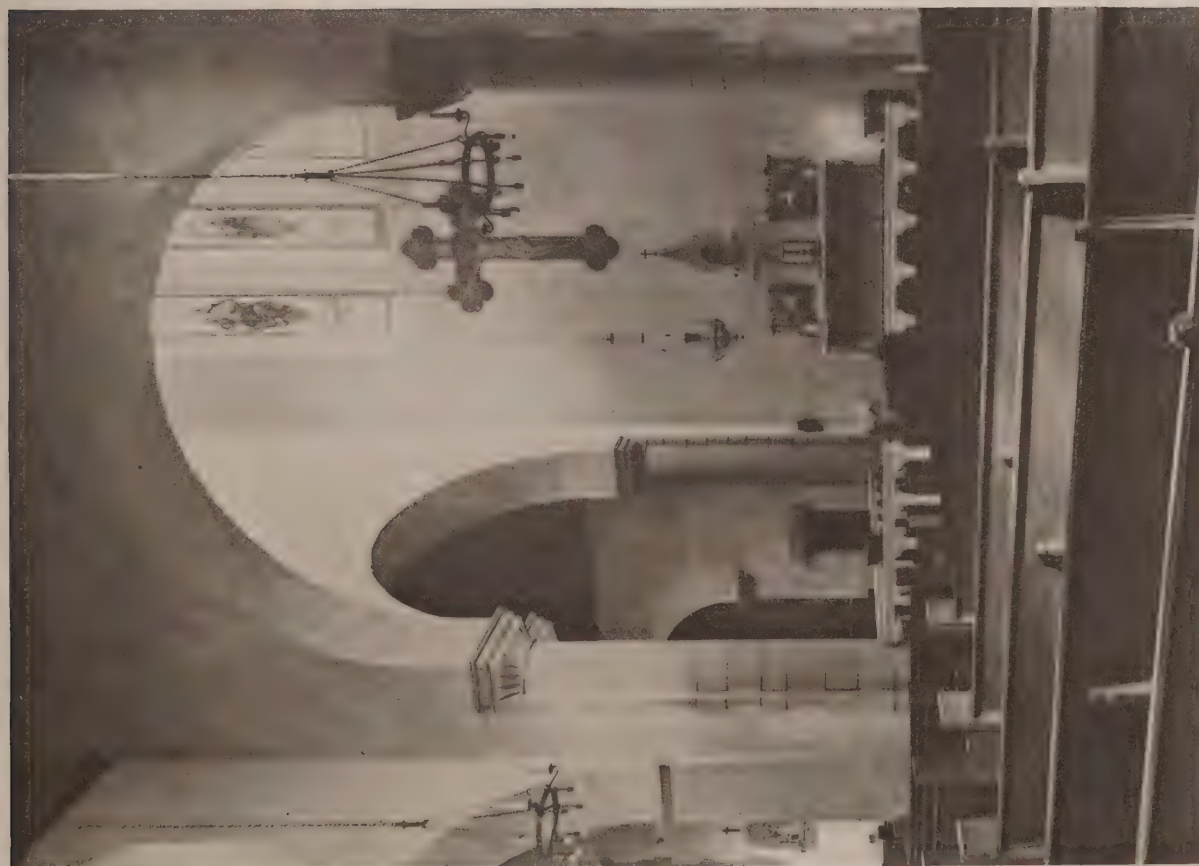
ST. BRIGID'S ROMAN CATHOLIC CHURCH, WESTBURY, LONG ISLAND, N. Y.  
F. BURRILL HOFFMAN, JR., ARCHITECT







VIEW LOOKING DOWN SIDE AISLE



VIEW LOOKING TOWARD CHANCEL

ST. BRIGID'S ROMAN CATHOLIC CHURCH, WESTBURY, LONG ISLAND, N. Y.

F. BURRALL HOFFMAN, JR., ARCHITECT





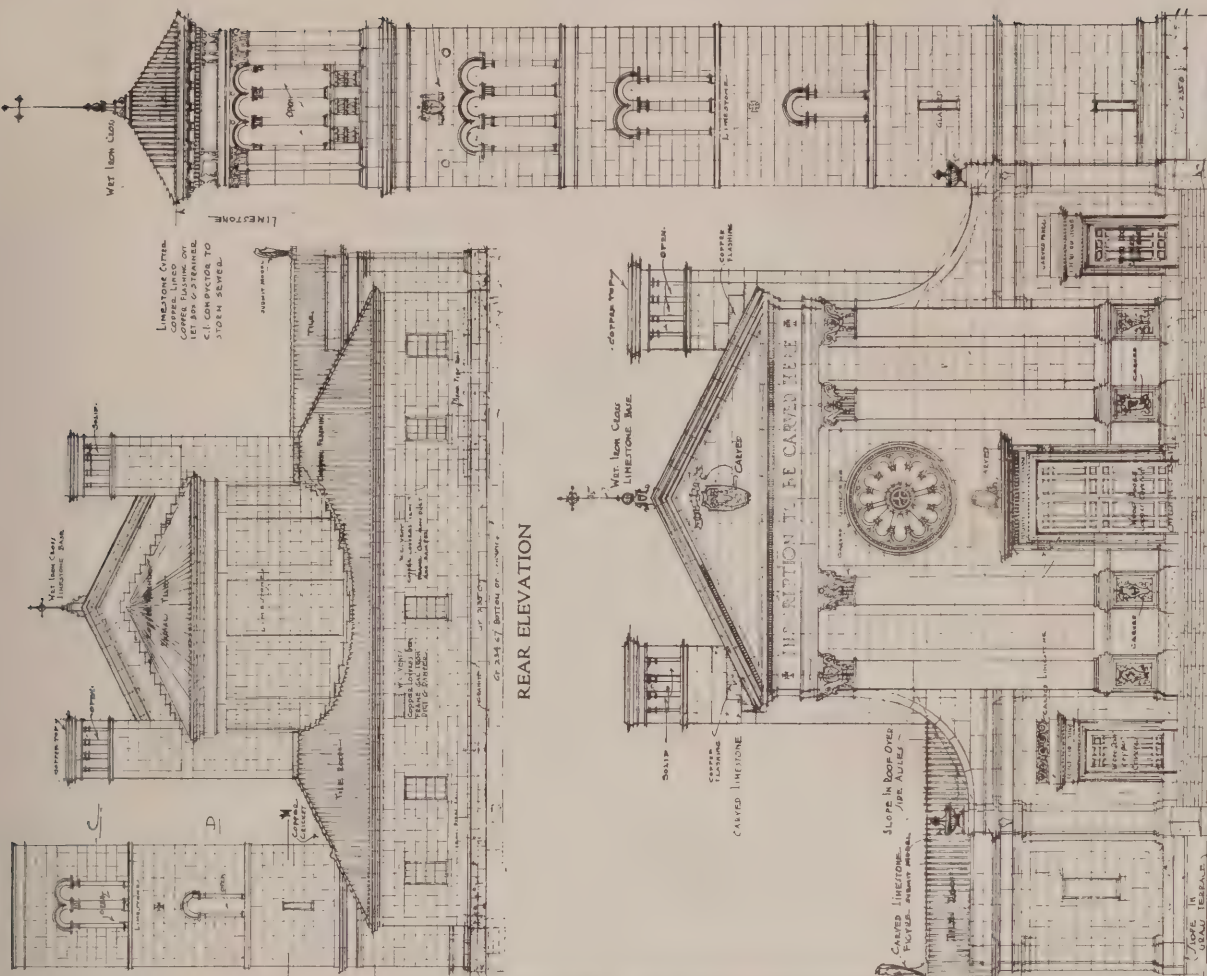


GENERAL VIEW FROM STREET

ST. MARY'S ROMAN CATHOLIC CHURCH, AKRON, OHIO  
EDWARD T. P. GRAHAM, ARCHITECT



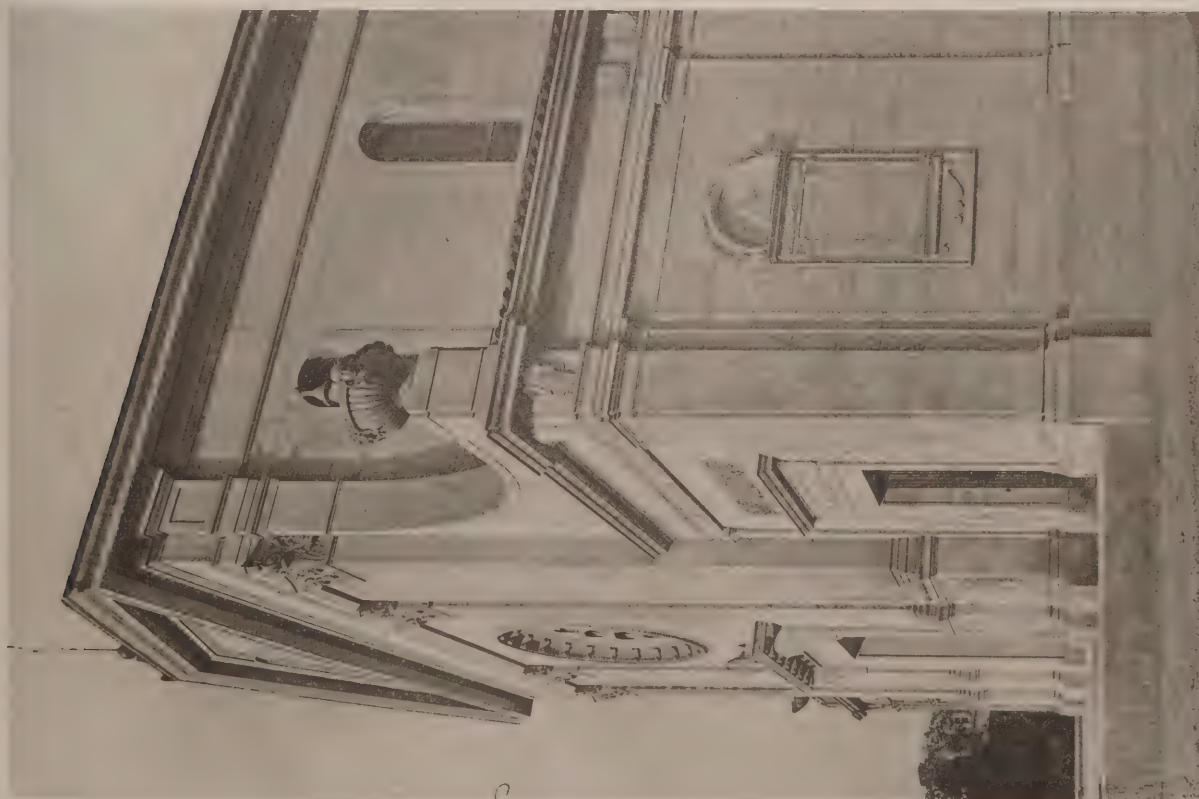




FRONT ELEVATION

ST. MARY'S ROMAN CATHOLIC CHURCH, AKRON, OHIO

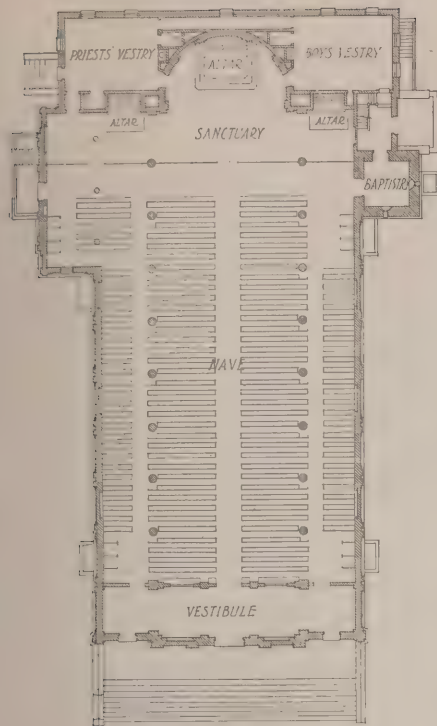
EDWARD T. P. GRAHAM, ARCHITECT



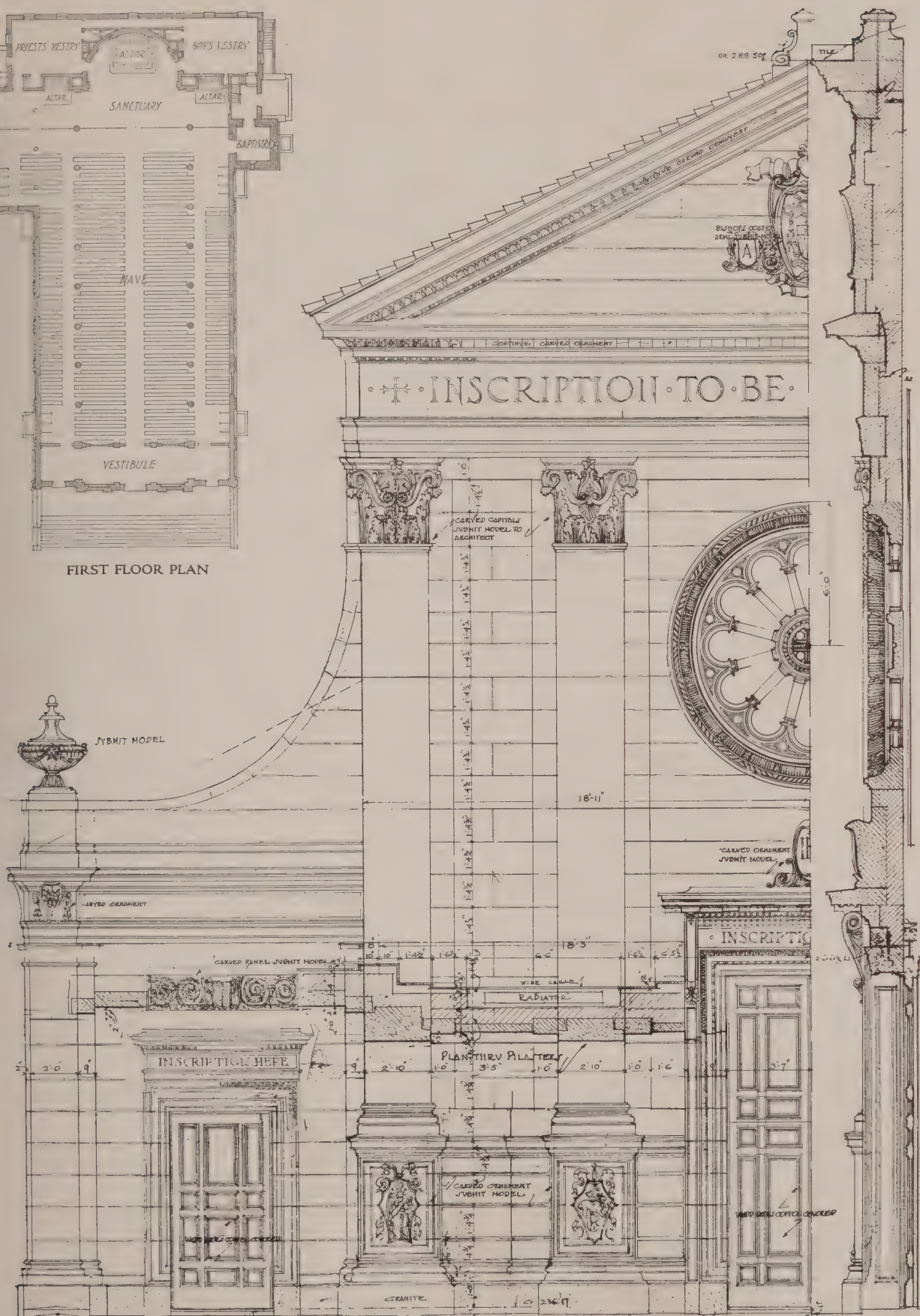
DETAIL OF MAIN FACADE







FIRST FLOOR PLAN



DETAIL OF MAIN ELEVATION

ST. MARY'S ROMAN CATHOLIC CHURCH, AKRON, OHIO  
EDWARD T. P. GRAHAM, ARCHITECT







INTERIOR VIEW LOOKING TOWARD CHANCEL  
ST. MARY'S ROMAN CATHOLIC CHURCH, AKRON, OHIO  
EDWARD T. P. GRAHAM, ARCHITECT







GENERAL VIEW FROM STREET

CHURCH OF THE BLESSED SACRAMENT, JAMAICA PLAIN, MASS.

CHARLES R. GRECO, ARCHITECT







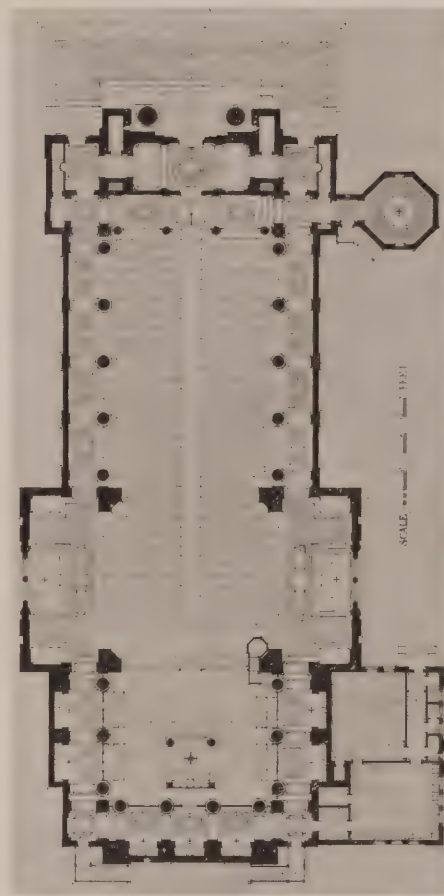
VIEW OF TRANSEPT AND DOME  
CHURCH OF THE BLESSED SACRAMENT, JAMAICA PLAIN, MASS.  
CHARLES R. GRECO, ARCHITECT







INTERIOR VIEW LOOKING TOWARD ORGAN GALLERY



FIRST FLOOR PLAN

CHURCH OF THE BLESSED SACRAMENT, JAMAICA PLAIN, MASS.

CHARLES R. GRECO, ARCHITECT



INTERIOR VIEW LOOKING TOWARD ALTAR







GENERAL VIEW FROM STREET

ST. MATTHEW'S ROMAN CATHOLIC CHURCH, DORCHESTER, MASS.

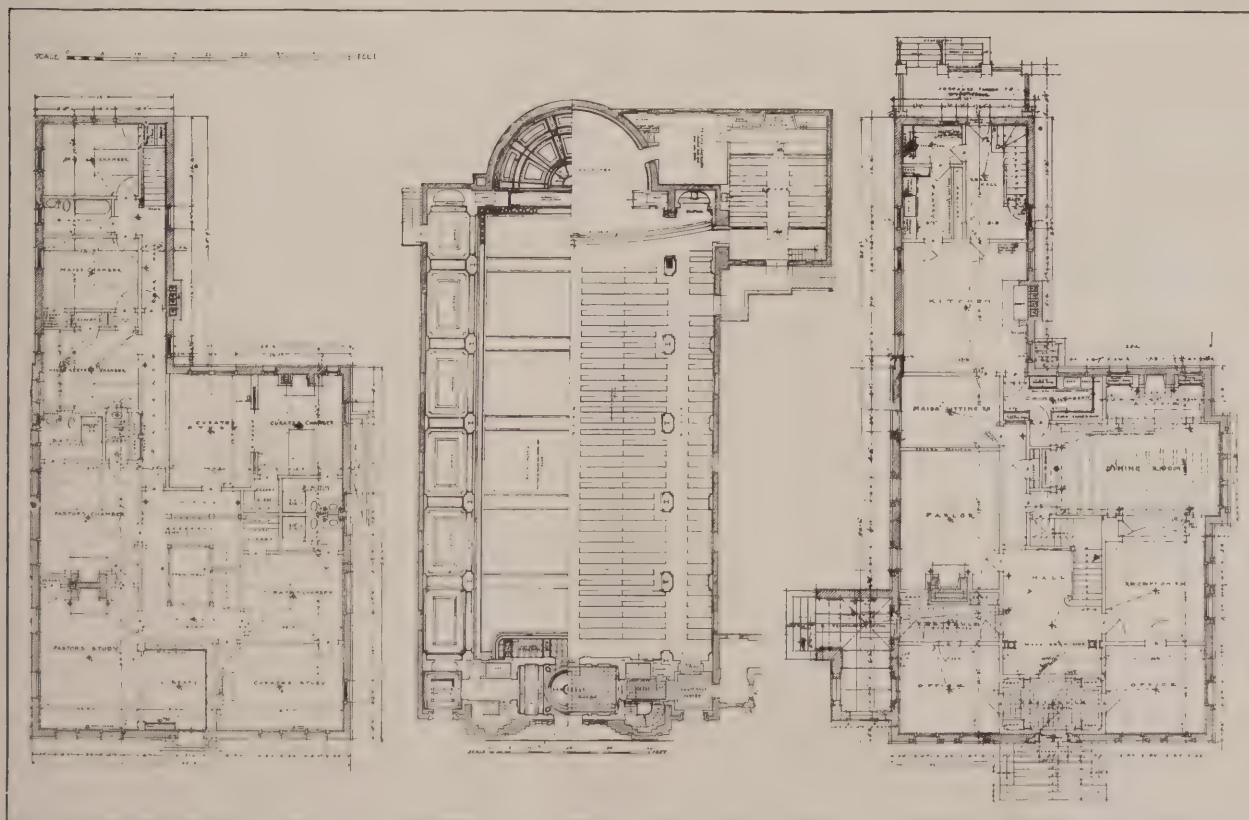
CHARLES R. GRECO, ARCHITECT







VIEW OF CHURCH AND RECTORY



SECOND FLOOR PLAN OF RECTORY

FIRST FLOOR PLAN OF CHURCH

FIRST FLOOR PLAN OF RECTORY

ST. MATTHEW'S ROMAN CATHOLIC CHURCH, DORCHESTER, MASS.

CHARLES R. GRECO, ARCHITECT







GENERAL VIEW OF FRONT FROM THE STREET  
ST. EDWARD'S CHURCH, BROCKTON, MASS.  
MAGINNIS & WALSH, ARCHITECTS







DETAIL OF TOWER AND SIDE AISLE ENTRANCE  
ST. EDWARD'S CHURCH, BROCKTON, MASS.  
MAGINNIS & WALSH, ARCHITECTS

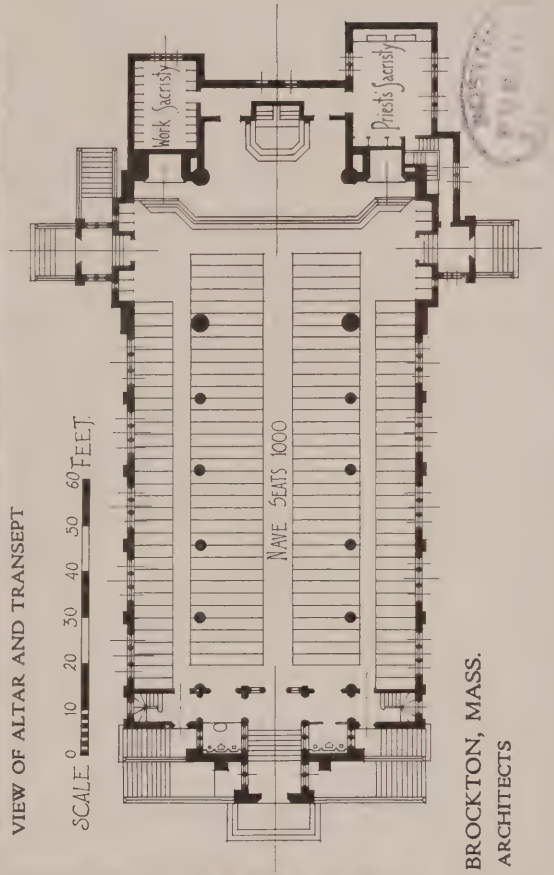






VIEW OF ALTAR AND TRANSEPT

SCALE 0 10 20 30 40 50 60 FEET

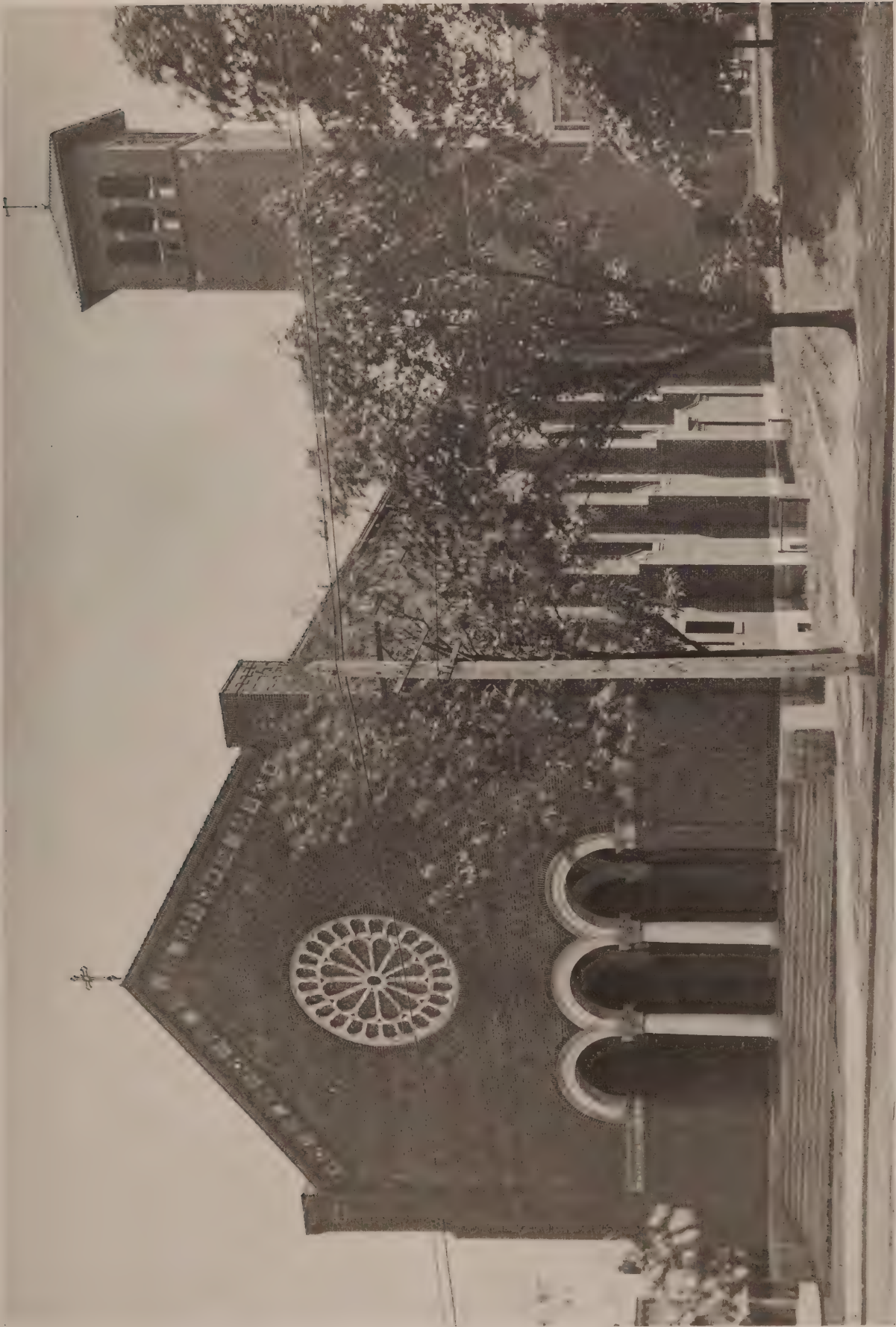


INTERIOR VIEW LOOKING TOWARD CHANCEL

ST. EDWARD'S CHURCH, BROCKTON, MASS.  
MAGINNIS & WALSH, ARCHITECTS



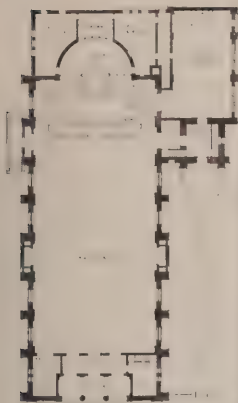




CHURCH OF THE HOLY ROSARY, COLUMBUS, OHIO  
H. H. Hiestand, Architect







VIEW FROM REAR



INTERIOR VIEW LOOKING TOWARD CHANCEL  
CHURCH OF THE HOLY ROSARY, COLUMBUS, OHIO  
H. H. HIESTAND, ARCHITECT







CHAPEL OF THE IMMACULATE CONCEPTION CONVENT, FERDINAND, IND.  
VICTOR J. KLUTHO, ARCHITECT







DETAIL OF APSE AND TRANSEPT  
 CHAPEL OF THE IMMACULATE CONCEPTION CONVENT, FERDINAND, IND.  
 VICTOR J. KLUTHO, ARCHITECT







DETAIL OF DOME



VIEW OF COURT AND CLOISTER

CHAPEL OF THE IMMACULATE CONCEPTION CONVENT, FERDINAND, IND.

VICTOR J. KLUTHO. ARCHITECT







VIEW ACROSS FRONT OF BUILDING  
KENRICK SEMINARY, ST. LOUIS, MO.  
JOHN T. COMES AND THOMAS F. IMBS, ASSOCIATED ARCHITECTS







VIEW LOOKING INTO COURT WITH CHAPEL WING AT RIGHT



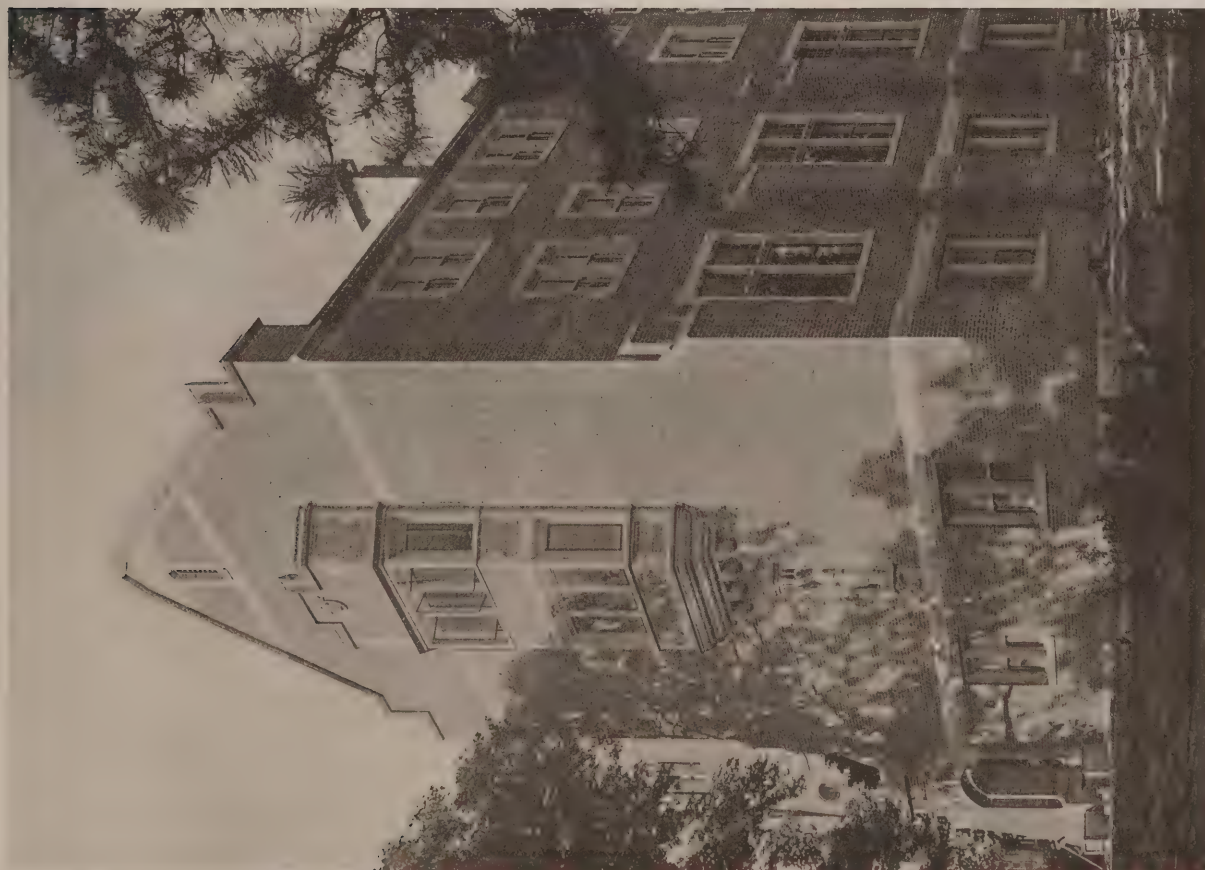
FIRST FLOOR PLAN

KENRICK SEMINARY, ST. LOUIS, MO.

JOHN T. COMES AND THOMAS F. IMBS, ASSOCIATED ARCHITECTS







DETAIL OF THEOLOGY WING GABLE



DETAIL OF TOWER AND ENTRANCE

KENRICK SEMINARY, ST. LOUIS, MO.

JOHN T. COMES AND THOMAS F. IMBS, ASSOCIATED ARCHITECTS







INTERIOR OF CHAPEL LOOKING TOWARD CHANCEL

KENRICK SEMINARY, ST. LOUIS, MO.

JOHN T. COMES AND THOMAS F. IMBS, ASSOCIATED ARCHITECTS



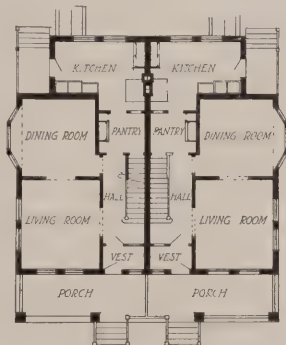


One arrangement that has been found practicable is to take the total cost and divide it in two equal parts, which will be first and second mortgages, respectively. The first mortgage is held by a financial institution and would be paid off in a period extending over about fifteen years. The second mortgage, held by the employer, would be paid off in instalments extending over a period of about twelve years. These would be reduced to one stipulated amount per year, so the sum the employee would pay would consist of principal and interest all together. This would be reduced by the proportionate amount when the second mortgage had been liquidated.

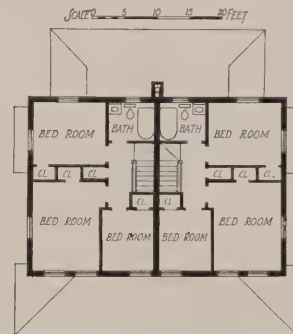
By carrying suitable fire insurance, the employer becomes fully protected and assured of the return of his entire investment within a period of twelve years, and his employees get the advantage of good homes from the beginning of the arrangement and without any large initial payment.

Various addenda can be made that add to the financial attractiveness to the employee as time goes on. Insurance can be arranged which enables the instalments to be paid during sickness and removes all debt in case of death.

An attempt to give costs per unit of family accommodation in an article of this nature would be misleading, as so many elements enter into its determination, but it is safe to calculate that under normal conditions 20 to 25 per cent of the salary earned will pay the interest on the in-



First Floor Plan



Second Floor Plan

vestment, taxes, and charges, and also refund the entire capital expenditure in fifteen years.

*Preliminaries in Starting a Housing Development.* Before entering upon a housing improvement it should be understood that all local laws and ordinances must be followed, whether the site be within the town or not, as some day the town may take over the development; also the development should be considered as a part of the general growth of the town and not as a small settlement by itself. A few fundamentals must be determined preferably by consultation between the employer and the expert who will handle the development before any progress can be made.

*First.* The number of operatives it is desirable, or necessary, to accommodate to relieve the pressure sufficiently to enable all to get reasonably good accommodation.

*Second.* The location in which the improvement shall be undertaken.

*Third.* The form the development shall take, — individual, two-family, rows, or multi-family dwellings.

*Fourth.* The funds available, which will determine whether outside financial aid is needed either as separate investment or on a mortgage basis.

*Fifth.* The method of insuring the employees of the firm making the improvement.

To determine these fundamentals all matters should be given careful study, and the decision arrived at



Views of Two Double Houses of Different Elevations and Similar Plans, Bridgeport, Conn.

Alfred C. Bossom. Architect

should be based as far as possible upon definite facts and not as frequently has been the case by assuming much which even a little careful investigation would show to be at variance with actual conditions. For instance, under No. 1 an inspection, survey, and record should be prepared of the existing accommodations in use and available, covering details such as price, the number of rooms and rate per room, in which section of town, and the anticipated natural housing growth. This should all be charted to show at a glance in diagrammatic form the existing condition and similarly the anticipated increased number of operatives at the plant. The permanence of the employment of other employees in town must be considered, for the movement of these people automatically would release so much more accommodation.

As to the location, this should be determined after a careful examination of all the available property, and charted with such facts as area price, price per unit, distance from plant and time of transportation, assessments that will have to be paid, etc. The natural drainage and soil should be considered and if on the outskirts of the town, whether the plot has good trees, natural landscape possibilities, and protection from the prevailing winds.

The local tax rates, the improvement of transportation and cost of same, means for the wife to

go to market, the children to school, and the family to amusements places should receive their share of attention. It is a mistake to anticipate that trolley lines will be extended should an employer undertake a considerable development, and the author's experience is that all such matters as this must be reduced to definite legal agreements before the improvement be undertaken, as failing this the owner is at the mercy of the local public service corporation who may compel the employer to actually bear the expense of making all such extensions. This applies with equal force to water, gas, electric, and telephone services.

In many cases it is desirable when providing housing facilities to provide stores, and in parts of Europe co-operative enterprises have been encouraged, the employers endeavoring to make the housing developments as attractive as possible from all angles. Further consideration should be given to the different churches, schools, and places of amusement, and the possible future natural growth of the town, and whether adjacent improvements are good or poor, the likely enhancement or otherwise of the real estate value, and also the districts that have to be traversed passing to and from the development. The nearer to the center of the town the development has to be, the more the garden has to disappear and the yard takes its place, and where this is the case the yard must always be paved and any earth left so ar-



General View and Floor Plans of Double House, Bridgeport, Conn.

Alfred C. Bossom, Architect





ranged that it will not spread as mud all over the house and lot to make things appear unsightly.

Where the men have very early work hours the proximity of the housing development to the plant is important and becomes more important in rigorous climates.

Many instances occur where a few existing houses are located upon an available and desirable piece of property. In such cases should this property be selected it is best to move all of the old houses into one corner of the development, doing any repairs or needed changes, and so leave the greater portion of the property free for the best improvement that can be devised under the controlling conditions. This also saves upon insurance, makes for general attractiveness, and avoids inconvenience of having to take care of tenants on the property while making the major improvement.

The monetary value of available land has to be judged in conjunction with the cost per unit of the most desirable form of building; thus three-story buildings in very cheap semi-country property would be preordained to failure, although it would show up very well on paper, and yet under proper conditions of development the same land could be used with immediate and marked success.

In London and Liverpool, and in congested cities like New York and Pittsburgh, five-story tenement "walk-up" buildings have been built with success; but this type of improvement should be undertaken now only after most mature consideration, as the American workman is daily learning to avoid inconvenience, and a strictly American community would most likely refuse to occupy the accommodation provided above the third floor except at a very low rental.

To determine the most desirable form the improvement can take in addition to all the previously enumerated considerations, the value of the available land must be considered; similarly the size of families, for although the average be five persons, with certain nationalities this varies, and the proportion of unmarried varies in different localities. For instance, men without families are always more numerous in new undertakings and these have to be cared for either by the married men or in special barrack hotels built for the purpose.

The usual proportion of unattached men to married is as one to two, but all figures should be carefully checked in the actual locality, for this bears a decided relation to the wages earned by the different grades of men and therefore to the rent that they can afford to pay for their homes.

One-third of the wages is found to be the ultimate maximum that workmen can possibly pay for purchasing the home, taxes, and insurance, and not above 25 per cent for renting.

The result of an exhaustive survey on this subject throughout the country shows that from 10 to 25 per cent only of workers live in well planned and ventilated houses, and these often have features that are very undesirable, and it takes from 16 to 17 per cent of the workers' wages for rent—not instalment purchase—in small towns and from 20 to 25 per cent in large cities, and the intermediate places follow accordingly.

From the author's figures, derived from developments that he has actually carried out, it is plain that multi-family houses within city limits can be built for a much lower figure than a group of two-family houses, both furnishing the same accommodation per family. The cost of the former is about 68 per cent of that of the latter. The land cost per family is still proportionately less again.

Thus the relative value of the land and improvement in relation to the wages paid have a material bearing upon the type of the development.

It must always be kept prominently in the forefront of consideration that a diversified type of improvement is more pleasing than one stamped with too much apparent uniformity, and this does not necessarily increase the construction cost of the component parts if the houses be thoroughly standardized.

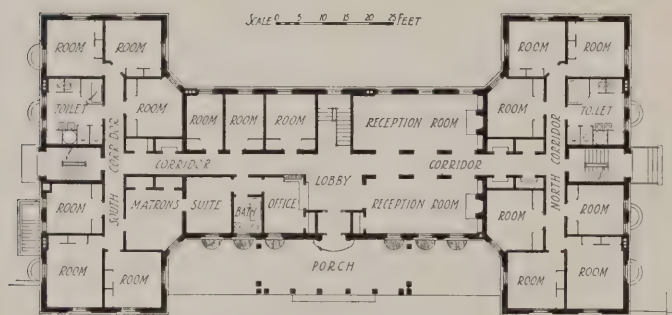
A safe return and a conservative investment must be looked for, not a real estate speculation producing abnormal profits. A sinking fund must be created, if the accommodation provided is only rented, to reduce it to its actual real estate value in a number of years, and a fund to cover contingencies if the same be sold. If rented only, long term leases should not be made, or employees leaving the company could still occupy their houses to the detriment of those actually engaged. A reduction system which by periods allows bonuses to apply toward the reduction of the mortgage, provided the employee has continuous employment, and the repurchasing power of the owners on a certain understood basis should the employee leave the employer, are features that are well to introduce into the financial scheme.

By these and similar methods the employee constantly receives advantages for good and continued services, and the owner benefits in having employees better equipped physically and mentally.

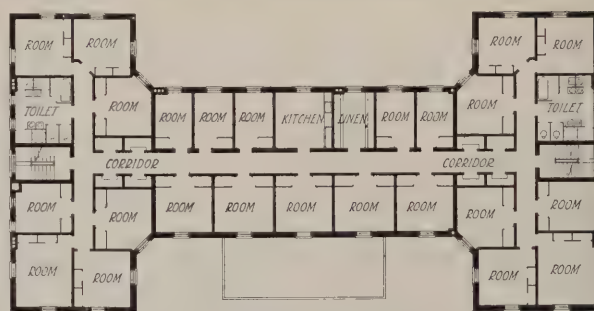




GENERAL VIEW OF EXTERIOR



FIRST FLOOR PLAN



SECOND FLOOR PLAN

GIRLS' DORMITORY, BRIDGEPORT, CONN. HISS &amp; WEEKES, ARCHITECTS

TYPICAL FOUR-FAMILY HOUSE, BRIDGEPORT, CONN.  
HISS & WEEKES, ARCHITECTS

SECOND FLOOR PLAN



FIRST FLOOR PLAN



## The Remington Housing Development

SINCE the beginning of the war the city of Bridgeport, Conn., has nearly doubled its population, with the result that it has been a difficult matter to house properly the newly arrived and constantly arriving workmen and their families. To meet these conditions in part, the Remington Arms Union Metallic Cartridge Company began, a little more than a year ago, the development of a housing scheme for their employees. Already houses have been built on two sides of three new streets, and the general character of these houses is shown in the accompanying illustrations. The initial part of the work was carried out under the direction of Alfred C. Bossom, architect; but the later developments have been under the direction of Hiss & Weekes, architects. In the beginning the need for houses was so urgent that little time could be given to a careful study of all details. Nevertheless, that portion of the work which has been completed seems to meet the needs adequately and will serve as a nucleus for the larger development in contemplation.

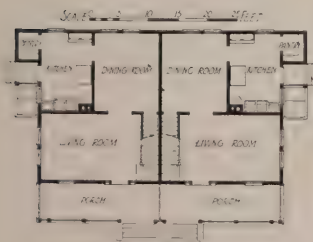
It is obvious that every industrial group has its own peculiar conditions, which must be dealt with, and the need for understanding these conditions is important. In a work of this nature it is essential to give due consideration to the different racial divisions, their religious inclinations, and other important characteristics. These conditions were all given careful thought



Front View and Floor Plans of Single Frame House, Bridgeport, Conn.  
Hiss & Weekes, Architects

by the management of the Remington Company and their assistants, and the indications are that the problems involved have been very successfully solved. Nearly all of the houses are either of burnt-clay or concrete construction with roofs of slate. Materials were bought in large quantities and the houses erected under competent supervision, and this resulted in keeping the costs down. The interior woodwork is of cypress, finished with varnish. The floors throughout are of long-leaf yellow pine, scraped and shellacked. All houses have modern plumbing and bathrooms and are equipped with a good grade of fixtures. The floors of the bathrooms are of ceramic tile with sanitary glazed base. Each bathroom has a medicine cabinet. Sewage and water supply lines were laid by the company and will later become a part of the Bridgeport system. Electric current is furnished by the city and each room has ample lighting fixtures. The kitchens have cabinets and provision for gas ranges. Heating is by the hot air system. There are brick firewalls between houses built *en bloc*.

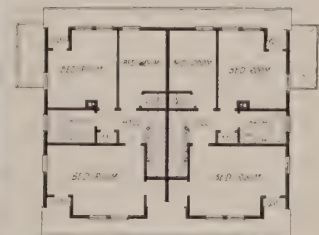
The rentals charged were determined by the salaries paid, and the total cost of each house was made to conform to a figure which would permit of a rental approximately the amount of the weekly wage. Naturally the houses provided for the skilled mechanic are of a better type than those provided for the un-



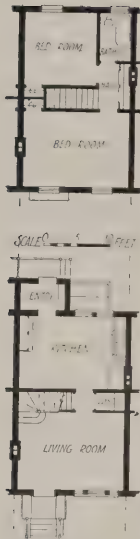
First Floor Plan



Double Frame House, Bridgeport, Conn.  
Hiss & Weekes, Architects



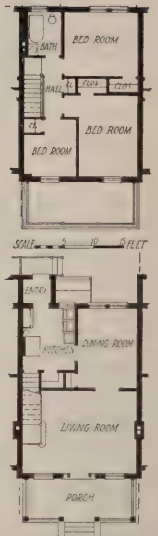
Second Floor Plan



Floor Plans  
Intermediate  
Houses



Group of Eleven Houses, Bridgeport, Conn.  
Hiss & Weekes, Architects



Floor Plan  
Center House

skilled. The houses are rented or sold according to the inclination of the tenant. A Building Loan Association provides the necessary assistance to any of the employees wishing to invest.

The best renting cottages are those with the smallest number of rooms, and consequently lower rentals. Experience in this development would seem to recommend six rooms as the maximum, although houses with four or five rooms and bath are more desirable for the average family.

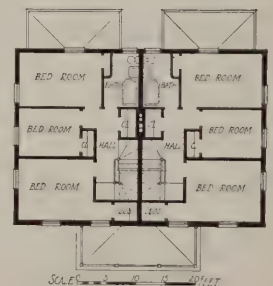
The Remington Company employs a considerable number of girls, and to provide for them three large dormitories have been erected, each accom-

modating about one hundred and thirty-five girls. Separate rooms may be had for \$1.75 to \$3.00 per week. Each dormitory has a restaurant in the basement which furnishes breakfast, luncheon, and dinner at a nominal cost. Six dollars per week is the average cost for room, table board, and other service required. In addition there are laundries, rest rooms, rooms for entertaining, bathing, and other facilities.

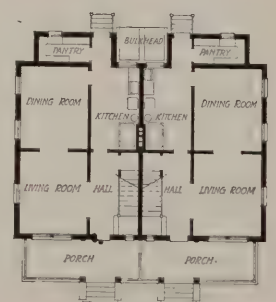
A further development of this undertaking will provide for the social and welfare aspect of the problem in a clubhouse, general restaurant building, athletic field, parks, and planting.



Typical Double House, Bridgeport, Conn.  
Hiss & Weekes, Architects



Second Floor Plan



First Floor Plan



## PLATE DESCRIPTION

CONVENT AND ACADEMY OF NOTRE DAME, FENWAY, BOSTON, MASS. PLATES 17-23. This building is devoted to two different purposes and is organically divided in two portions, one being devoted to the academy and the remaining half to the convent. In plan, the building resembles the capital letter E. The first floor is given a stately approach from the Riverway through a large vaulted porch. The entrance corridor is 16 feet wide and on its axis is placed the chapel. The academy side of the second floor is devoted exclusively to class rooms and laboratories, the corresponding level of the other side of the building being given over to the sisters' dormitories. The chaplain's quarters are situated toward the rear of the chapel over the sacristies and accessible only from them. The chief feature of the academy on the third floor is the great music hall, which is provided with 24 independent apartments for individual practice. The interior arrangement was determined by the clients, and this had to be rigidly respected so that the working out of the exterior design was the subject of a great deal of study. The variety of mass and skyline which the architects have incorporated has been unusually successful in giving so large a building an element of picturesqueness; equal success was had in giving exterior expression to the two elements of the plan,—the convent and the academy.

ST. BRIGID'S ROMAN CATHOLIC CHURCH, WESTBURY, L. I., N. Y. PLATES 24-27. This interesting stone church which is so appropriate to its location is derived in design from early English Gothic and Norman precedents. The walls are constructed of rubble stone obtained from the New York subway excavations. The trim, both exterior and interior, is cast artificial stone. The roof is of blue black slate graduated in thickness and exposure. The interior has a seating capacity of 600 people. It is finished in rough plaster which with the open timbered roof, decorated with bright spots of color, and the generously dimensioned piers and columns, give the effect of the smaller English parish churches. The altar is temporary. The carved and painted wood cross, which is a feature of the chancel, was donated by the architect. Aisle and chancel floors are tiled.

CHURCH OF THE BLESSED SACRAMENT, JAMAICA PLAIN, MASS. PLATES 32-34. This church is of the Latin cross type of plan and has an interior length of 180 feet and a width of 90 feet across the transepts, with a seating capacity of almost 1100. The nave is flanked by side aisles, which are con-

tinued, as an ambulatory, around the sanctuary, forming a distinctive feature of the interior. The high altar, with its baldachin, is a notable piece of wood carving. The feature of the interior is the richly ornamented barrel vault, which forms the ceiling, except at the crossing where the dome strikes the dominant note. The design has been consistently carried out in the Roman Renaissance style in brick with marble columns and panels. At the left of the front of the church is the octagonal baptistery, with domed ceiling, separated from the main church by wrought-iron gates and forming an interesting adjunct of the exterior.

ST. MATTHEW'S ROMAN CATHOLIC CHURCH, DORCHESTER, MASS. PLATES 35, 36. The plan is derived from the early Roman basilicas, having nave and aisles, the sanctuary being in the form of an apse. The main façade is marked by massiveness and simplicity of composition. The church is connected with the rectory by an arcaded cloister, midway in which is the baptistery. The interior, which is 52 feet in height, is treated with a segmental vaulted ceiling carried on large piers treated with Ionic pilasters, with a subsidiary Roman Doric order with ornamented entablature marking the side aisles. The chapel seats 42 people and the main church about 1000 people.

ST. EDWARD'S ROMAN CATHOLIC CHURCH, BROCKTON, MASS. PLATES 37-39. This building is a free rendering of the early English Gothic, the distinguishing characteristic of which is the slender lancet window arranged in interesting groups. The design is clothed in an extremely pleasing tone of gray brick, the openings being trimmed with artificial stone of a lighter value. The main approach to the church is through a central porch, the aisle entrances being in subordinate relation, but so placed as to be on the axis of the side passages. The roof is of black slate with copper ridges. The auditorium is divided in the customary manner and has a seating capacity of 1050. Slightly projecting transepts give an interesting effect in the interior and this is enhanced by a deep sanctuary. The aisle windows are arranged in triple panels; no woodwork is used for the frames, the glass being set in the stone jambs. The columns or piers are without capitals, the mouldings of the arches dying into the body of the shaft, imparting a fluid quality to the architectural lines. No window opening whatever is pierced in the chancel wall, the light comes from the sides, and the wall is treated as a great reredos.

## EDITORIAL COMMENT

THE succession of epochs in the history of mankind may be clearly traced through the course of architectural development; each important period in the world's history is paralleled by a corresponding period in architecture. The breaking down of barriers between races and nationalities in the past has led to a constantly increasing knowledge and appreciation of foreign arts, till to-day in American buildings there may be seen evidences of the architecture of nearly every civilized country.

The diverse forms and cosmopolitan character of America's architecture are not due however, primarily, to political conditions, because during our national existence we have experienced no period of advancement or decline of sufficient importance to influence our art seriously; rather are they due to the many opportunities for study of all art offered to architects and laymen alike through foreign travel, technical education, and architectural books and papers now so widely circulated.

The present European struggle in which we are becoming more active each day is an event of world-wide as well as national importance and will probably bring about greater political and economic changes in the countries involved than any previous war in modern times. Because of the generally recognized fact that future events may be forecast from a study of effects produced in the past under similar conditions, it is only reasonable to expect that an event of such importance as this war will be reflected in the lives, manners, and art of the present and succeeding generations.

One of the certain effects on our architecture will be an even broader appreciation of European art than we have to-day. The inevitable interest which the nation as a whole will take in its allies will awaken a desire to know more of their lives and customs, making it easy for us to absorb the best of their ideas and adapt them to our own use. Foreign travel has always been considered a desirable aid in developing the art instinct and of special value to the architect. In the days of the Renaissance the great master architects were invariably those who had given much study to the art of foreign countries. In modern times, with the great increase in the number of men in the profession, the proportion of those that have studied outside their own country has greatly decreased, but what many could not do for themselves the war is now doing. Architects and draftsmen who are enlisted in the service will have an opportunity of observing the architec-

ture of other countries than their own; they will live among works of architecture of both the simplest and most imposing natures, and will be able to study them in their native atmosphere and surroundings, to an extent far beyond comparison with any other method. These men upon returning home will have a greatly widened view of their profession and their consequent increased abilities will not fail to impress themselves on American architecture.

An effect of greater importance if possible than a widened appreciation of all architectural forms will undoubtedly result from economic conditions. With the greatly increased demand for steel and other products ordinarily used in building for war purposes, prices have reached figures which are nearly prohibitive for many types of structure. This condition presents a serious problem to architects, but at the same time it affords the profession a splendid opportunity to perform a distinct service in creating new types of construction in which only the minimum of the products required by the government will be used. The ingenuity of the American architect is capable of meeting the situation. It may not be possible to evolve new methods at once; they will in all probability develop from greater or less changes in our present systems; the change, however, must come if the pressing needs for building of all types which will soon be felt are to be supplied at a cost warranting investment of funds.

THE Royal Gold Medal for Architecture, given by His Majesty the King of England, was recently conferred upon M. Henri Paul Nénot, the noted French architect. In making the presentation address Mr. Ernest Newton, President of the Royal Institute of British Architects, gave expression to the co-operative spirit which the war is bringing about when he remarked, "I can only regret that it is not my pleasant duty to-day to decorate, as well as M. Nénot, a distinguished architect representative of the other allies."

IN order to give sufficient opportunity of illustrating in one issue recent Roman Catholic Church work, we have postponed the publication of the second and concluding paper on "One-Story and Open-Air Schoolhouses in California," by Mr. William C. Hays, to our September issue. For the same reason we have omitted the plates of measured drawings on early American Architectural Details, but their publication will be resumed with the following numbers.



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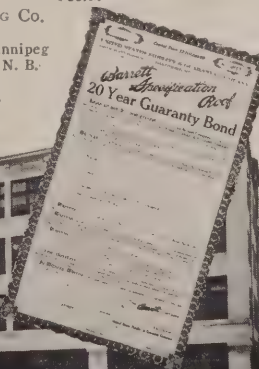
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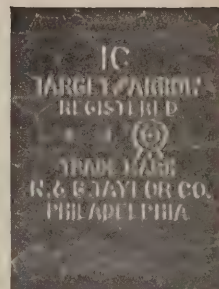
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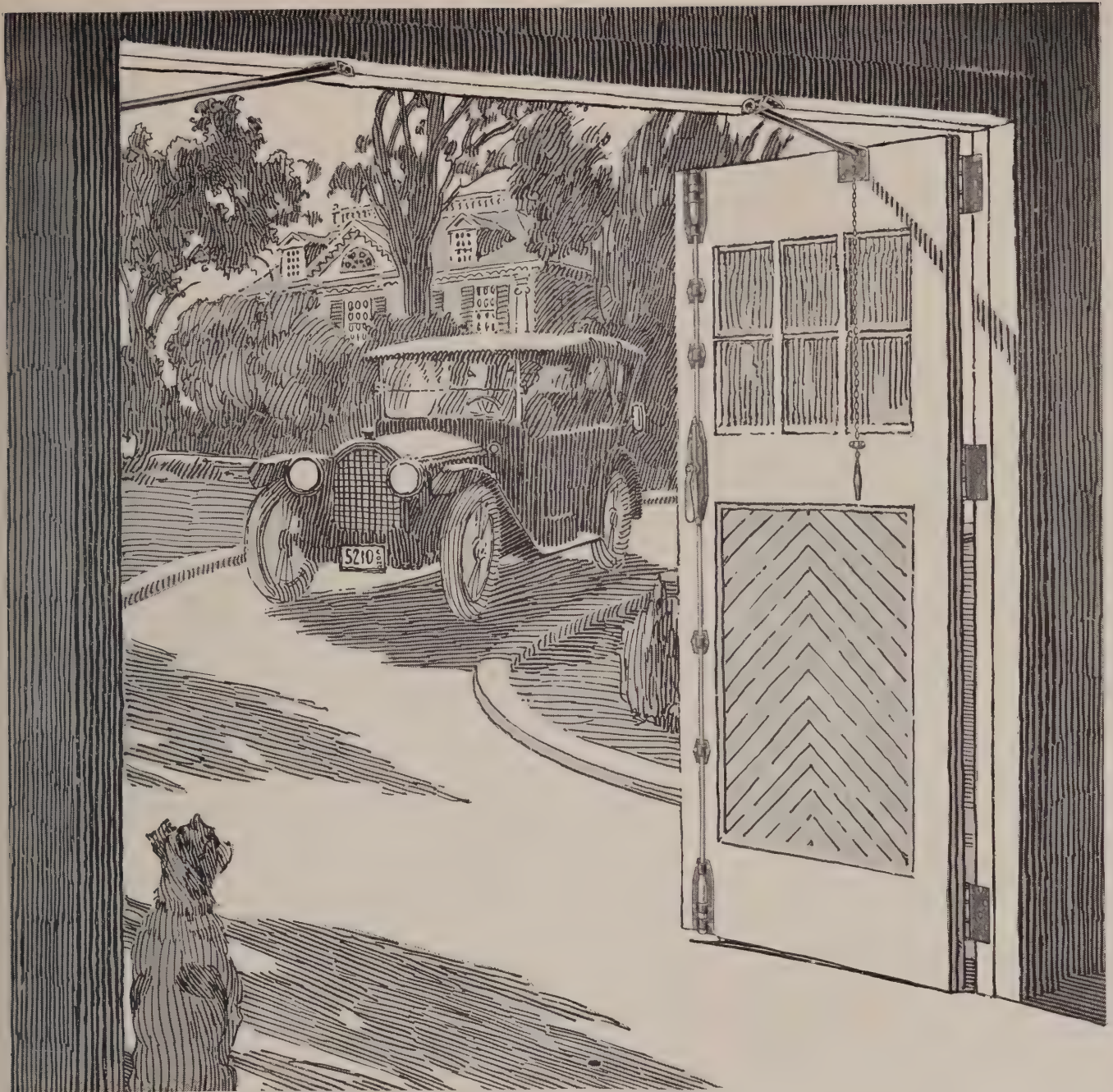
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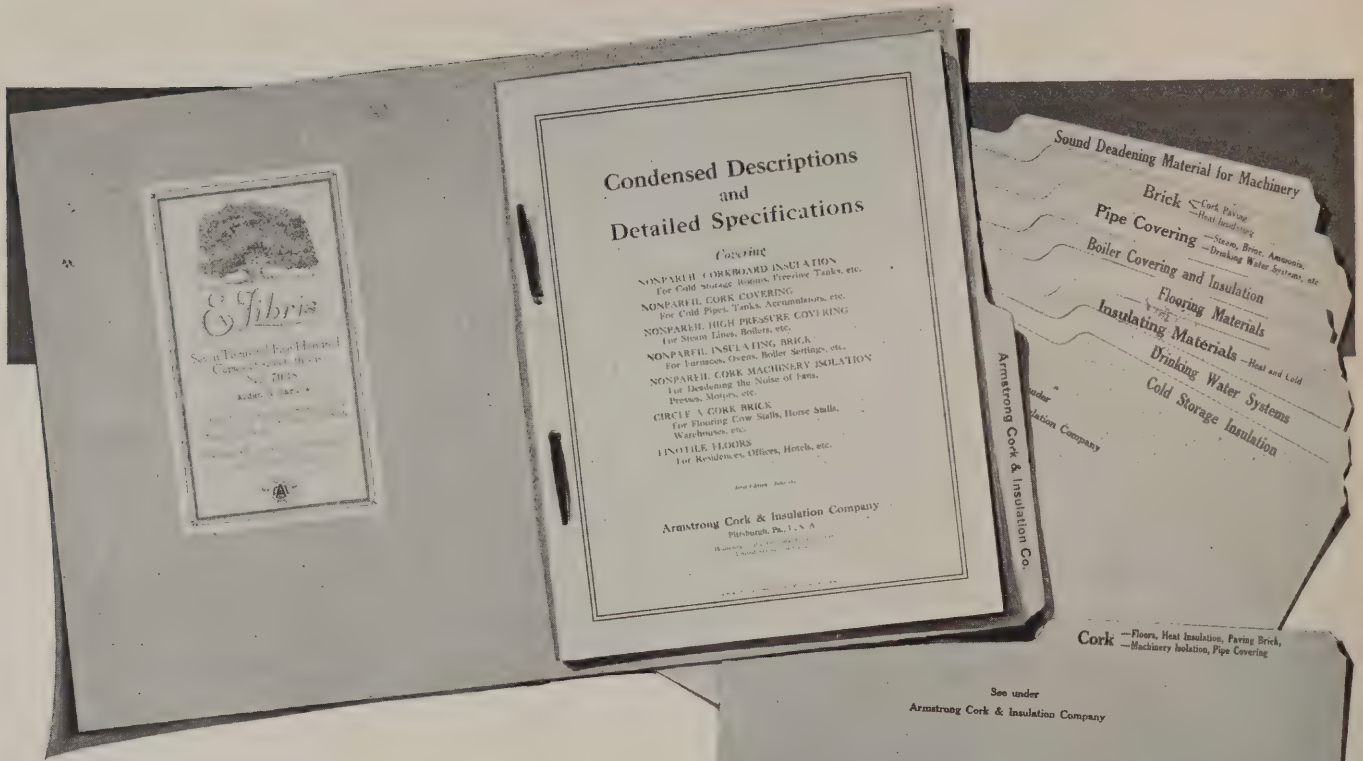
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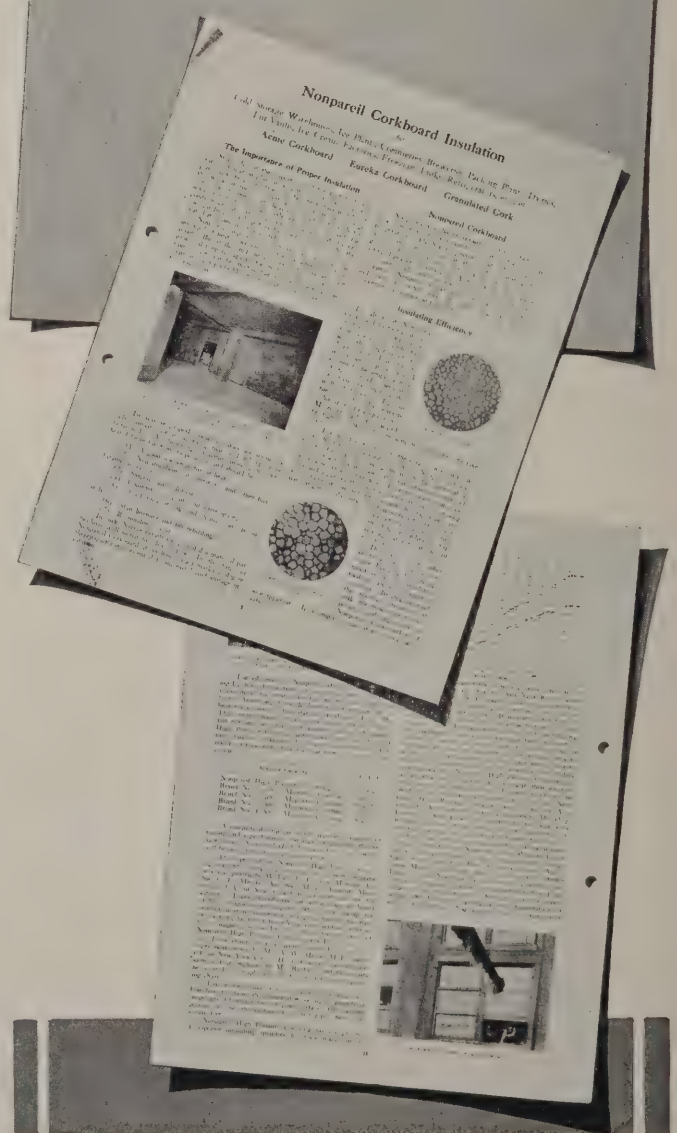
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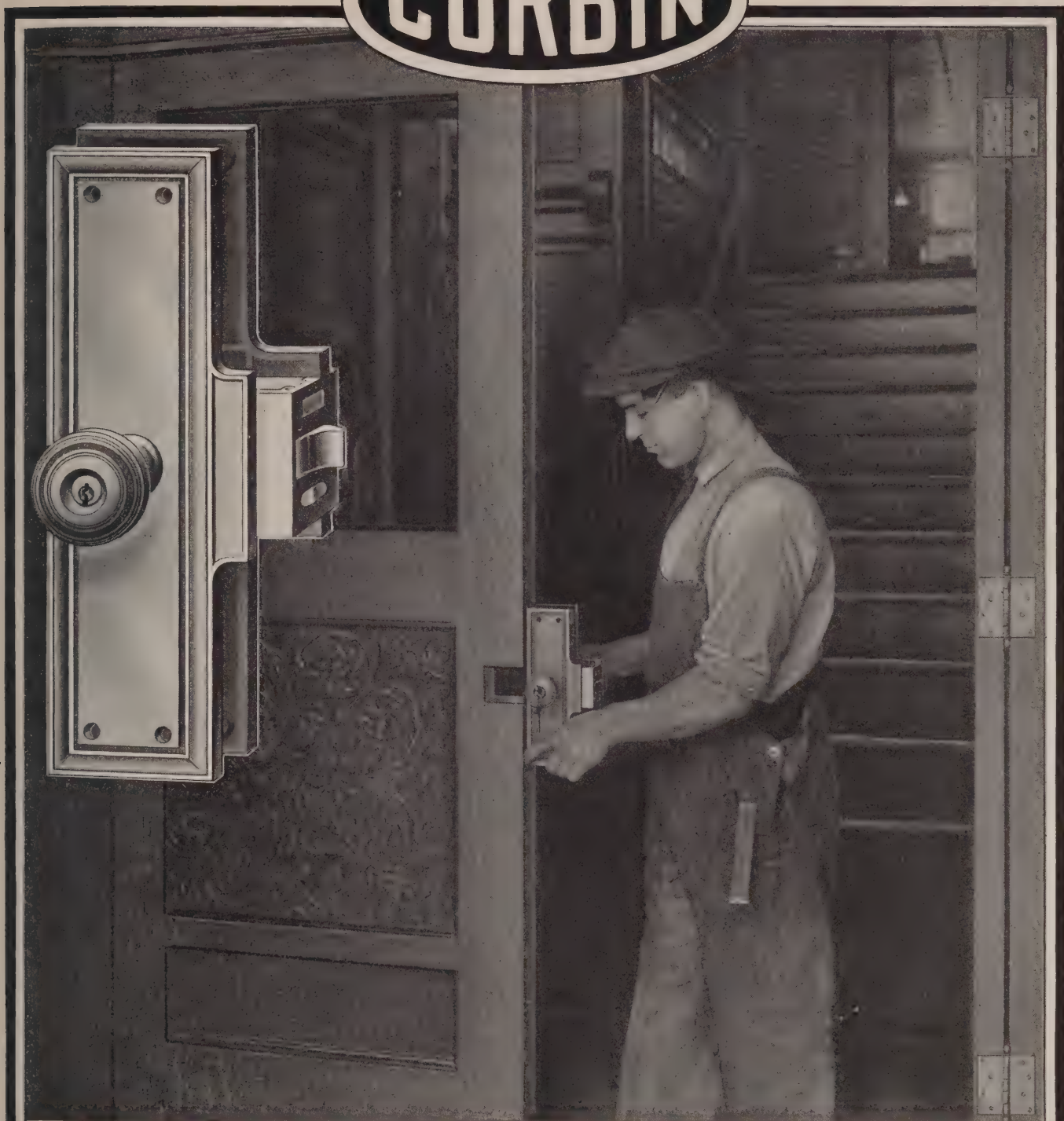
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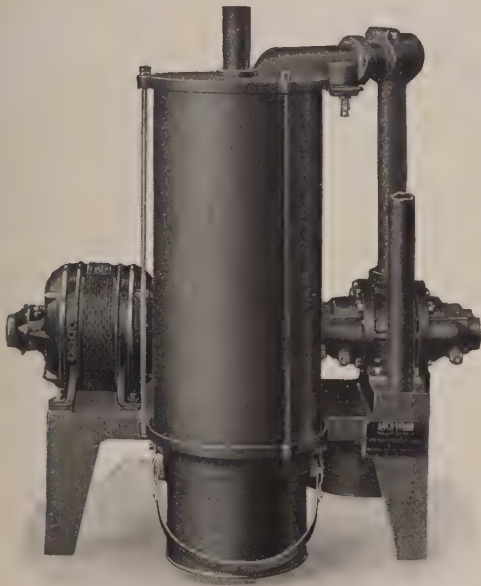
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Portfolio. 10½ x 13½ in. Plates.

## BRICK

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Enameled Brick. Catalog. 6 x 9½ in. 25 pp. Color plates.

**Claycraft Brick Co.**, 907 Hartman Building, Columbus, Ohio.  
Booklet. 6 x 9 in. 39 pp. Plates showing examples of work.

**Hydraulic-Press Brick Co.**, St. Louis.

Bonds and Mortars in the Wall of Brick. Treatise on brick design. 8½ x 11½ in. 27 pp.  
Brick Scales and Tables. Fifteen scales for vertical and horizontal measurements, with explanatory booklet and tables. 8 x 10 in. 32 pp.

Moulded and Ornamental Brick. Catalog. 4½ x 6½ in. 140 pp.  
The Hy-tex House of Moderate Cost. Booklet. 8 x 10½ in. 100 pp. 80 sketch plans and elevations.

The Brick Church and Parish House. Book of designs with floor plans from drawings submitted in competition. 10¼ x 13½ in. 80 pp.

**Sayre & Fisher Co.**, 261 Broadway, New York.

Brick — Enameled and Front. Catalog. 6 x 9 in. 24 pp. Color plates.

**Western Brick Co.**, Danville, Ill.

The Art of Stippling. Brochure giving history of development of stippling and its application to face brick. 4 x 6 in. 24 pp.

## CEMENT, PORTLAND

**Atlas Portland Cement Company, The**, 30 Broad Street, New York.

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Early Stucco Houses, with modern stucco specifications. Booklet. 8½ x 11 in. 24 pp.

Choosing the Garage, describing actual construction. Booklet. 8 x 10½ in. 26 pp.

Commercial Garages, with construction notes and architectural treatment. Booklet. 8 x 10½ in. 12 pp.

Color Tones in Stucco. Booklet with colored plates. 8½ x 11 in. 24 pp.

Building a Bungalow. Booklet. 8½ x 11 in. 18 pp. 4 color plates.

**Lehigh Portland Cement Co., The**, Allentown, Pa.

Forty-one Concrete Reasons. Booklet. 6 x 9 in. 34 pp.

Cement Facts. Booklet. 5¼ x 6¼ in. 18 pp.

The Expense-Proof Farm. Booklet. 6 x 9 in. 100 pp.

Lehigh Portland Cement. Illustrated. Booklet. 8½ x 12½ in. 42 pp.

**Sandusky Cement Co., The**, Dept. S., Engineers Building, Cleveland, Ohio.

Medusa White Portland Cement. Booklet. 8½ x 11 in. 52 pp.

Medusa Waterproofed White Portland Cement. Booklet. 6 x 9 in. 20 pp.

Medusa Waterproofed Gray Portland Cement. Booklet. 6 x 9 in. 20 pp.

## CHIMNEYS

**Heinicke, Inc., H. R.**, 147 Fourth Avenue, New York.  
Chimneys. Bulletin. Methods of construction.

## CONDUIT

**National Metal Molding Co.**, 1113 Fulton Building, Pittsburgh.  
Handbook on National Metal Molding. Complete details and installation instructions. 4¼ x 6 in. 96 pp.  
Bulletin No. 50. Rigid Conduits. 8½ x 11 in. 12 pp.

## CONSTRUCTION, FIREPROOF

**General Fireproofing Co., The**, Youngstown, Ohio.  
Fireproofing Handbook. 6 x 9 in. 112 pp.

## CONVEYORS, GRAVITY

**Otis Elevator Company**, Eleventh Avenue and 26th Street, New York.  
Otis Gravity Conveyors. Catalog. 6 x 9 in. 56 pp.

## DOORS, WINDOWS, AND TRIM, METAL

**Dahlstrom Metallic Door Co.**, 88 Blackstone Avenue, Jamestown, N. Y.  
Safety First for Schools. Booklet regarding fireproof equipment for schools. 3¼ x 8½ in. 12 pp.  
Safety First for Hospitals. Booklet regarding fireproof equipment for hospitals. 3¼ x 8½ in. 16 pp.  
Buildings as They Should Be. Booklet. 7½ x 10½ in. 44 pp.  
The Finishing Touch in Fireproofing Your Building. Booklet. 3¼ x 8½ in. 20 pp.

## DOORS, WINDOWS, AND TRIM, METAL — Continued

**Detroit Steel Products Co.**, 2717 East Grand Boulevard, Detroit, Mich.  
The Fenestra Line. Catalog. 8½ x 11 in. 15 sections. Blue prints.

**Lupton's Sons Co., David**, Witte and Tulip Streets, Philadelphia, Pa.

Lupton Service and Products, No. 9. Descriptive catalog with drawings and data for specifications. 8½ x 11 in. 100 pp. and cover.

**Merchant & Evans Co.**, Philadelphia.

Red Book. Catalog. 5½ x 8½ in. 190 pp.

**Trussed Concrete Steel Co.**, Dept. 57, Youngstown, Ohio.

United Steel Sash. Catalog. Details and specifications. 8½ x 11 in. 128 pp.

## DUMBWAITERS

**Sedgwick Machine Works**, 182 Liberty Street, New York.

"Service Sheets." Standard specifications, plans, etc. 16½ x 21½ in.

## ELECTRICAL EQUIPMENT

**Hart & Hegeman Mfg. Co., The**, Hartford, Conn.

Catalog O. H & H Switches and Paiste Wiring Material. 9 x 10½ in. 106 pp.

**Hart Mfg. Co.**, Hartford, Conn.

"Diamond H" Switches and Receptacles. Descriptive booklet. 4 x 8½ in. 24 pp.

## ELEVATORS

**Otis Elevator Company**, Eleventh Avenue and 26th Street, New York.

Otis Electric Traction Elevators. Bulletin. 6 x 9 in. 28 pp.

Otis Residence Elevators. Bulletin. 6 x 9 in. 16 pp.

**Sedgwick Machine Works**, 182 Liberty Street, New York.

Selecting an Invalid Elevator. Booklet. 4¼ x 8¼ in. 8 pp.

## ESCALATORS

**Otis Elevator Company**, Eleventh Avenue and 26th Street, New York.

Otis Escalators. Bulletin. 6 x 9 in. 36 pp.

## FAIENCE, ARCHITECTURAL

**Rookwood Pottery Co.**, Cincinnati.

Faience Catalog with portfolio of plates. 9½ x 12½ in. 64 pp.

## FLOORING

**Armstrong Cork & Insulation Co.**, 132 24th St., Pittsburgh.  
Linotile Floors. Booklet. 6 x 9 in. 32 pp.

**Kennedy, Inc., David E.**, 55 Fifth Avenue, New York.

Nonpareil Cork Tile. Booklet showing patterns. 3½ x 5½ in. 34 pp.

Folder showing colors of tiles. 3½ x 5½ in. 4 pp.

Everlastic Tile. Folder. 3¼ x 6¼ in. 4 pp.

Mas-Oleum Floor. (Mastic Linoleum.) Folder. Specification Forms. 7½ x 9 in. 4 pp.

**Master Builders Company, The**, Cleveland, Ohio.

Master Builders Standard Specifications. 4 x 8 in. 8 pp.

Saniseal Liquid Concrete Floor Hardner. Descriptive booklet and directions. 3½ x 6½ in. 8 pp.

**Sonneborn Sons, Inc., L.**, Dept. 4, 264 Pearl Street, New York.

Lapidolith Specifications. Booklet. 8½ x 10½ in.

Scientific Investigation of the Action of Lapidolith on Concrete by Prof. R. J. Colony. Booklet.

**Toch Brothers**, Dept. 97, 320 Fifth Avenue, New York.

"R. I. W." Cement Filler and Cement Floor Paint. Booklet 5½ x 8 in. 28 pp.

## GARDEN POTTERY — See Pottery, Garden.

## GLASS CONSTRUCTION

**Berger Manufacturing Co.**, Canton, Ohio.

Berger's Radiant Sidewalk Lights. Catalog T. F. 8½ x 11 in. 42 pp.

**Keppeler Glass Constructions Inc.**, Architects Building, 101 Park Avenue, New York.

Bulletin No. 126. 8½ x 11½ in. 12 pp.

Bulletin No. 202. 9 x 12 in. 6 pp.

Bulletin No. 203. 9 x 12 in. 4 pp.

Bulletin No. 205. 9 x 12 in. 6 pp.





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Raymond Concrete Pile Company of Canada, Ltd., Montreal, Canada

SELECTED LIST OF MANUFACTURERS' PUBLICATIONS — *Continued from page 26*GLASS CONSTRUCTION — *Continued*

**Lord & Burnham Co.**, 42d Street Building, New York.  
Some Greenhouses We Have Built. Illustrations. Completed work. Catalog.  $9\frac{1}{2} \times 12\frac{1}{2}$  in. 98 pp.

## HARDWARE

**Columbian Hardware Co., The**, Cleveland, Ohio.  
Making It Easier to Buy Columbian Sash Pulleys. Folder.  $3\frac{3}{4} \times 8\frac{3}{4}$  in. 14 pp.

**Corbin, P. & F.**, New Britain, Conn.  
Colonial Hardware. Booklet.  $5 \times 7$  in. 32 pp.  
Corbin Door Checks. Catalog.  $5 \times 7$  in. 40 pp.  
Corbin Door Knockers. Booklet.  $5 \times 7$  in. 24 pp.  
General Catalog.  $10\frac{1}{2} \times 13$  in. 1200 pp.

**Imperial Brass Mfg. Co.**, 1208 West Harrison Street, Chicago.  
Hardware Catalog No. 105.  $6 \times 9$  in. 36 pp.

**Reliance Ball Bearing Door Hanger Co.**, Grand Central Terminal Building, New York.  
Door Hangers, etc. Catalog.  $8 \times 9\frac{1}{2}$  in. 32 pp.

**Russell & Erwin Mfg. Co.**, New Britain, Conn.  
General Catalog.  $9 \times 12$  in. 1250 pp.  
Russwin Period Design Booklet.  $6 \times 8$  in. 72 pp.  
Russwin Fire Exit Bolt Catalog.  $6 \times 9$  in. 46 pp.  
Russwin Monograph (28 subjects).  $3\frac{1}{2} \times 6$  in. 6 pp.

**Stanley Works, The**, New Britain, Conn.  
Wrought Hardware. Catalog. Describing wrought steel hinges, butts and door bolts.  $6\frac{1}{2} \times 10$  in. 260 pp.  
Stanley's Wrought Steel Garage Door Hardware. Booklet.  $3\frac{1}{2} \times 6\frac{1}{4}$  in. 8 pp.  
Properly Hung Doors. Booklet.  $5 \times 7\frac{1}{2}$  in. 16 pp.  
"Stanley" Sherardizing. Descriptive booklet.  $3\frac{1}{2} \times 6\frac{1}{4}$  in. 4 pp.

**Vonnegut Hardware Company**, Indianapolis.  
Von Duprin Self-Releasing Fire Exit Device. Catalog 12F.

## HEATING EQUIPMENT

**American Blower Co.**, Detroit, Mich.  
"A B C" Heaters. Bulletin.  $8\frac{1}{2} \times 11$  in. 24 pp.  
Vento Cast-Iron Hot-Blast Heater. Bulletin.  $8\frac{1}{2} \times 11$  in. 44 pp.

**American Radiator Co.**, 816 S. Michigan Avenue, Chicago.  
The Ideal Fitter. Handbook with specification data.  $6\frac{1}{2} \times 3\frac{3}{4}$  in. 336 pp.

**Boytton Furnace Co., The**, 106 West 37th Street, New York.  
Square Pot Heaters. Catalog.  $7 \times 9\frac{1}{4}$  in. 60 pp.

**Crane Co.**, 836 South Michigan Avenue, Chicago.  
Steam Goods. Complete pocket catalog.  $4\frac{1}{2} \times 6$  in. 620 pp.

**Fulton Company, The**, Knoxville, Tenn.  
Catalog D.  $7 \times 10\frac{1}{4}$  in. 22 pp.  
The Ja-Nar'. Catalog. Color plates and specification data.  $8\frac{1}{2} \times 11$  in. 20 pp.

**Gorton & Lidgerwood Co.**, 96 Liberty Street, New York.  
Modern House Heating. Catalog No. 88.  $4\frac{1}{4} \times 7$  in. 32 pp.

**Jenkins Bros.**, 30 White Street, New York.  
Catalog and Price List.  $4 \times 6\frac{1}{4}$  in. 256 pp.

**Kelsey Heating Co., The**, 238 James Street, Syracuse, N. Y.  
Architects' Portfolio. 12 plates showing plans, heating, specifications, and layouts.  $8\frac{1}{2} \times 11$  in.  
Kelsey System of Heating and Ventilating. Booklet. 36 pp.  
Kelsey Warm Air Generators. Booklet. 32 pp.

**Lord & Burnham Co.**, 42d Street Building, New York.  
Burnham Boilers. Catalog No. 56.  $4 \times 10$  in. 19 pp.

**Sturtevant Co., B. F.**, Dept. B, Hyde Park, Boston, Mass.  
Heating and Ventilating. Treatise.  $6\frac{1}{2} \times 9$  in. 325 pp.  
Heating and Ventilating Layouts. Blue print book. Bulletin No. 227.  $8\frac{1}{2} \times 11$  in. 28 pp.  
Sturtevant Heaters. A book for architects.  $8\frac{1}{2} \times 11$  in. 32 pp.

**United States Radiator Corporation**, Detroit.  
A Modern "House Warming." Booklet.  $6 \times 9$  in. 30 pp.  
The "Complete Line." Technical data. Catalog.  $4\frac{1}{4} \times 7\frac{1}{4}$  in. 270 pp.

## HOISTS

**Gillis & Geoghegan**, 544 West Broadway, New York.  
The G. & G. Telescopic Hoist (all models). Booklet A.  $8\frac{1}{2} \times 11$  in. 16 pp.

## HOLLOW TILE — See Tile, Hollow

## INSULATION

**Armstrong Cork & Insulation Co.**, 132 24th Street, Pittsburgh.  
Nonpareil Corkboard Insulation. Scientific treatise.  $6 \times 9$  in. 130 pp.  
Nonpareil High Pressure Covering. Scientific treatise.  $6 \times 9$  in. 84 pp.

**Cabot, Inc., Samuel**, 141 Milk Street, Boston.  
"Service Sheets." Details of Construction and Methods of Using Cabot's Quilt.  $16\frac{1}{2} \times 21\frac{1}{2}$  in.

**Johns-Manville Co., H. W.**, Madison Avenue, New York.  
J-M Keystone Hair Insulator. Booklet.  $6 \times 9$  in. 16 pp.  
How to Reduce Coal Bills 25 Per Cent. (J-M Asbestocel Pipe Covering.) Booklet.  $3\frac{1}{2} \times 6$  in. 8 pp.

## JOISTS AND STUDS, PRESSED STEEL

**Berger Manufacturing Co.**, Canton, Ohio.  
Metal Lumber. Series of technical bulletins 12F especially prepared for architects.  $8\frac{1}{2} \times 11$  in. 32 pp.  
Riblex, Bulletin No. 14.  $8\frac{1}{2} \times 11$  in. 4 pp.

**Trussed Concrete Steel Co.**, Pressed Steel Dept., Youngstown, Ohio.  
Kahn Pressed Steel Construction. Catalog. Complete details and specifications.  $8\frac{1}{2} \times 11$  in. 32 pp.

## LATH, METAL

**Berger Manufacturing Co.**, Canton, Ohio.  
Berger's Expanded Metal Lath. Booklet.  $3\frac{1}{2} \times 6$  in. 44 pp. Supplement. 24 pp.

**General Fireproofing Co., The**, Youngstown, Ohio.  
Herringbone Rigid Metal Lath. A complete catalog on Herringbone Metal Lath.  $6 \times 9$  in. 32 pp.

**North Western Expanded Metal Co.**, 934 Old Colony Building, Chicago, Ill.  
Kno-Burn Expanded Metal Lath. Treatise on metal lath, with details and specifications.  $6 \times 9$  in. 52 pp.  
"Chanelath" Handbook. Treatise on ribbed metal lath details and specifications of its application to reinforced concrete construction and for plastering.  $6 \times 9$  in. 64 pp.

**Trussed Concrete Steel Co.**, Dept. H-57, Youngstown, Ohio.  
Hy-Rib Handbook. Specifications.  $5\frac{1}{2} \times 7\frac{1}{4}$  in. 142 pp.

**Wright Wire Co.**, Worcester, Mass.  
General Catalog. Description and full particulars of wire lath, wire fencing, ornamental iron work, elevator cabs, railings, partitions, and grille work.  $6 \times 9$  in. 224 pp.  
Wire Lath. Booklet L. Shows where Wright wire lath has been used.  $3\frac{1}{2} \times 6\frac{1}{2}$  in. 16 pp.

## LIGHTING EQUIPMENT

**Ivanhoe-Regent Works of General Electric Co.**, Cleveland.  
Lighting Handbook. Semi-technical on general lighting practice.  $4 \times 7$  in. 94 pp.  
Semi-Indirect Lighting Bowls. Catalog No. 108.  $8 \times 10\frac{1}{2}$  in. 48 pp.  
Holophane Reflectors and Fittings. Catalog No. 80.  $4 \times 7$  in. 50 pp.  
Ivanhoe Reflectors and Fittings. Catalog No. 303.  $4 \times 7$  in. 50 pp.

**Luminous Unit Co.**, St. Louis.  
Brascolite — The Modern Semi-Indirect Lighting System. Catalog No. 5.  $8\frac{1}{4} \times 10\frac{1}{4}$  in. 24 pp.  
Brascolite Data. Scientific data sheets. Portfolio  $9 \times 11\frac{1}{2}$  in. Blue prints.  
Aglites. Folder catalog. All-glass lighting fixtures.  $5\frac{1}{4} \times 8$  in. 8 pp.

**McFaddin & Co., H. G.**, 42 Warren Street, New York.  
Emeralite. Booklet. Colored plates.  $3\frac{1}{2} \times 6\frac{1}{4}$  in. 32 pp.

**National X-Ray Reflector Co.**, 243 West Jackson Boulevard, Chicago.  
Engineering Data Book. Technical handbook.  $6 \times 9$  in. 125 pp.  
Illumination from Concealed Sources — How to Plan and Specify Indirect Lighting. Scientific treatise.  $12 \times 15$  in. 52 pp. 36 detail drawings.

**St. Louis Brass Mfg. Co.**, St. Louis.  
"Concealite" Catalog A. Lighting fixtures for auditoriums, banks, show windows, etc., from concealed or semi-concealed sources.  $7\frac{1}{2} \times 10\frac{1}{2}$  in. 20 pp.

## METAL LATH — See Lath, Metal.

## METAL TRIM — See Doors, Windows, and Trim, Metal.

## METAL WORK, ORNAMENTAL

**Gorham Co. Architectural Bronze, The**, Fifth Avenue and 36th Street, New York.  
Architectural Mouldings and Rosettes. Catalog.  $9\frac{1}{4} \times 12\frac{1}{2}$  in. 16 plates.  
"Service Sheets."  $16\frac{1}{2} \times 21\frac{1}{2}$  in.

**Polachek Bronze and Iron Co., John**, 480-494 Hancock Street, Long Island City, N. Y.  
Distinctive Metal Work. Booklet.  $8\frac{1}{2} \times 11$  in. 6 pp.

**Smyser-Royer Company**, 1225 Race Street, Philadelphia, Pa.  
Portfolio illustrating standards and other lighting fixtures.  $4\frac{1}{2} \times 10\frac{1}{4}$  in. 175 pp. thus far.

**Tuttle & Bailey Mfg. Co.**, 52 Vanderbilt Avenue, New York.  
Special Designs of Grilles and Screens in Bronze, Brass, Iron, and Steel. Catalog No. 66A.  $6\frac{1}{2} \times 10$  in. 40 pp.

**Winslow Bros. Company**, 4600-4700 West Harrison Street, Chicago, P. O. Box No. 803.  
Ornamental Iron and Bronze. Illustrations of completed work.  $8\frac{1}{2} \times 11$  in. 300 pp.

## OFFICE SUPPLIES, ARCHITECTS'

**Dixon Crucible Co., Joseph**, Dept. 224-J, Jersey City, N. J.  
"Eldorado" — The Master Drawing Pencil. Booklet.



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## SELECTED LIST OF MANUFACTURERS' PUBLICATIONS—Continued from page 28

## ORNAMENTS, PLASTIC

**Jacobson & Company**, 241 East 44th Street, New York.  
Architectural and Decorative Ornaments. Catalog. 9¼ x 12¼ in. 192 pp.

## PAINTS, VARNISHES, AND WOOD FINISHES

**Arco Company, The**, Wise Building, Cleveland, Ohio.  
Arco Specifications. Loose-leaf specifications for full Arco line. 22 specifications. 8½ x 11 in.

**Berry Bros.**, Detroit, Mich.  
Natural Woods and How to Finish Them. Complete varnish specifications. 4¾ x 6½ in. 94 pp.  
Luxeberry Cement Coating. Color card. 3½ x 8½ in. 3 pp.

**Boston Varnish Co.**, Everett Station, Boston.  
Kyanize Enamel. Specifications. Booklet. 5 x 7 in. 20 pp.  
Kyanize White Enamel. Directions. Circular. 3½ x 6 in. 8 pp.  
Price List of Varnishes and Enamels. 3½ x 6 in. 24 pp.

**Dixon Crucible Co., Joseph**, Dept. 224-J, Jersey City, N. J.  
Philosophy of Protective Paint. 3¼ x 6½ in. 24 pp.

**Lowe Bros. Co., The**, 101 Park Ave., New York and Dayton.  
Architects' Mellotone Handbook. 3 x 8 in. 27 pp. Color plates.  
High Standard Paint and Varnish Specifications. Handbook. 4½ x 7 in. 70 pp.  
Paint and Painting. Directions and data. 5 x 9 in. 30 pp.  
Varnish and Varnishing. Treatise. 5 x 9 in. 44 pp.

**Murphy Varnish Co.**, Newark, N. J.  
The House that Found Itself. Booklet. 6¼ x 9¼ in. 28 pp.  
Harmony in Interior Decoration. Booklet. 5¼ x 8¼ in. 56 pp.  
Dealer's Descriptive List. Booklet. 4½ x 6¼ in. 28 pp.  
Beautiful Boats and How to Care for Them. Booklet. 5½ x 8¼ in. 50 pp.

**O'Brien Varnish Company, The**, Washington Street, South Bend, Ind.  
Specification Data. Information concerning O'Brien line of varnishes and interior finishes. 8½ x 11 in.

**Smith & Co., Edward**, P. O. Box 1780, New York.  
Architects' Handbook. Specifications. 5 x 7½ in. 24 pp.

**Wadsworth, Howland Co., Inc.**, 139 Federal Street, Boston.  
Bay State Finishes, Stains, and Varnishes. Catalog No. 10. Color cards.

## PARTITIONS, FOLDING AND ROLLING

**Folding Partition Co., Inc.**, 200 Broadway, New York, N. Y.  
Sectionfold Partitions. Catalog with detail sheet. 20 x 27 in.

## PILES

**MacArthur Concrete Pile and Foundation Co.**, 120 Broadway, New York.  
The Pedestal Pile. Catalog. Engineering data. 6 x 9 in. 64 pp.

**Raymond Concrete Pile Co.**, 140 Cedar Street, New York.  
Raymond Concrete Piles. Catalog. 8½ x 11¼ in. 56 pp.

## PIPE

**Byers Company, A. M.**, 235 Water Street, Pittsburgh.  
Bulletin No. 26. Tables and Specifications. Bulletin (2d Edition, Enlarged and Revised). 8½ x 11 in. 24 pp.  
Bulletin No. 27. The Experience of Practical Men. 8½ x 11 in. 40 pp.  
Selection of Pipe for Modern Buildings. Booklet of special interest to architects. 4 x 6 in.  
On the Trail of Byers Pipe. Booklet. 4 x 6¼ in. 46 pp.

**Central Foundry Company**, 90 West Street, New York.  
Soil Pipe and Fittings. Catalog. 4 x 7½ in. 88 pp.  
The Lynn Drain Trap. A leaflet containing description.  
Combination Vent, Revent, and Drainage Fittings. Catalog. 4¼ x 6¼ in. 183 pp.

**National Tube Company**, Frick Building, Pittsburgh, Pa.  
Shelby Mechanical Tubing. Booklet. 3½ x 6 in. 35 pp.  
Boiler Tubes List No. 6, 1916. Booklet. 4 x 6½ in. 16 pp.  
Pipe List No. 5, 1913. Booklet. 4 x 6½ in. 20 pp.  
National Bulletins, Nos. 1 to 27, inclusive. 8½ x 11 in.  
National Pipe Standards. Booklet. Appendix to 1913 edition. Tables and useful information pertaining to tubular goods. 4 x 6½ in. 400 pp.

## PLASTER

**Hydrated Lime Bureau of the National Lime Manufacturers' Association**, 1506 Arrot Bldg., Pittsburgh.  
Standard Specifications for Hydrated Lime Plastering. Pamphlet E. 6¼ x 9¼ in. 20 pp.  
Better Plastering and Better Acoustics. Bound booklet. 6¼ x 9¼ in. 40 pp.

**Kelley Island Lime & Transport Co.**, Cleveland, Ohio.  
Specifications for Hydrated Lime Plastering. Booklet. 6 x 9 in. 20 pp.  
Hydrated Lime Plaster. Booklet. 6¼ x 9¼ in. 12 pp.  
Tiger Tales. Booklet. 4 x 8 in. 12 pp.  
The Perfect Finishing Lime. Booklet. 4½ x 7¼ in. 34 pp.

## PLUMBING EQUIPMENT

**Crane Co.**, 836 South Michigan Avenue, Chicago.  
Catalog. 9 x 12 in. 834 pp.

**Imperial Brass Mfg. Co.**, 1208 West Harrison Street, Chicago.  
Shower Mixer. Booklet. 3 x 8 in. 16 pp.

**Kohler Co.**, Kohler, Wis.  
Kohler Catalog. Cloth bound. 9½ x 11¼ in. 164 pp.

**Standard Sanitary Mfg. Co.**, Dept. 4, Pittsburgh, Pa.  
"Standard" Catalog. General catalog of "Standard" line. 9 x 12 in. 676 pp.  
"Standard" Plumbing Fixtures for the Home. Catalog.  
Factory Sanitation. Catalog and scientific treatise. 9 x 12 in. 36 pp.

**Trenton Potteries Co.**, Trenton, N. J.  
Bathrooms of Character. Booklet. 4 x 7¼ in. 48 pp.  
Sanitary Pottery. Monthly house organ. 6 x 9 in. 16 pp. Color plates.

## POTTERY, GARDEN

**Atlantic Terra Cotta Company**, 1170 Broadway, New York.  
Garden Pottery. Catalog. 9 x 12 in. 12 pp.

## PUMPS

**Goolds Manufacturing Co.**, Seneca Falls, N. Y.  
All Types of Centrifugal and Reciprocating Power Pumps. Bulletins. 20 sections. 7¼ x 10 in.  
Handy Data on Power Pumping. Bulletin 118. 7¼ x 10 in. 24 pp.

## ROOFING

**American Sheet & Tin Plate Co.**, Frick Building, Pittsburgh.  
Copper—Its Effect Upon Steel for Roofing Tin. Scientific treatise. New edition. 8½ x 11 in. 24 pp.  
Pocket Reference Book. 2½ x 4¼ in. 168 pp.

**Barrett Company, The** (formerly The Barrett Mfg. Company), 47 Battery Place, New York City.  
Barrett's Specification Roofs—20-Year Guaranty Bond. Loose-leaf specifications with details. 8½ x 14 in.  
Foundation Waterproofing. Loose-leaf specifications. 8½ x 14 in.  
Tylke Shingles with Red or Green Crushed Slate Surface. For residences, etc. Descriptive booklet. 6 x 8 in.  
Velvex Creosote Shingle Stains. Descriptive folder showing colors on wood. 3½ x 6½ in.

**Boyle & Co., Inc., John**, 112-114 Duane Street, New York.  
Opinions of Practical Builders. Instructions for using Bayonne Roof and Deck Cloth. Book S. 3½ x 6 in. 24 pp.

**Carey Co., The Philip**, Lockland, Cincinnati.  
Architects' Book of Carey Roofing Specifications.

**Creo-Dipt Co.**, 1025 Oliver Street, North Tonawanda, N. Y.  
"Service Sheet" 1, No. 28. Working Drawings of Construction of "Thatch" Roof. Standard specifications and instructions for design and construction of same. 16½ x 21½ in.

**General Slate Company**, 200 Devonshire Street, Boston.  
General Slate Company—Roofing Slate. Booklet. 6 x 9 in. 16 pp.

**Johns-Manville Co., H. W.**, Madison Avenue, New York.  
J-M Corrugated Asbestos Roofing. Catalog. 6 x 9 in. 32 pp.  
J-M Transite Asbestos Shingles. Catalog. 6 x 9 in. 32 pp.

**Ludowici-Celadon Company**, 104 South Michigan Avenue, Chicago.  
Roofing Tile. A detailed reference for architects. 9¼ x 13½ in. 106 pp.  
Roofing Tile Catalog. 3¼ x 9 in. 10 pp.  
The Roof Beautiful. Booklet. 6¼ x 9¼ in. 40 pp. Color plates.  
Why Tile Is Best. Booklet. 3¼ x 6¼ in. 8 pp.

**Taylor Co., N. & G.**, 300 Chestnut Street, Philadelphia.  
A Guide to Good Roofs. Booklet. 3¼ x 5½ in. 24 pp.  
Selling Arguments for Tin Roofing. Booklet. 6 x 9¼ in. 80 pp.  
"Service Sheets." Working drawings showing details of construction of heavy ribbed and standing seam tin roofing; also color suggestions for tin roofs and tables of covering capacity of tin. 16½ x 21½ in.  
Standard Specifications for Tin Roofing Work. 7½ x 9 in.

## STONE

**Indiana Limestone Quarrymen's Association**, P. O. Box 505, Bedford, Ind.  
Indiana Limestone Booklet. Vol. I. 6 x 8¼ in. 40 pp.

## STORE FRONTS

**Detroit Show Case Co.**, 467 Fort Street West, Detroit, Mich.  
Metal Store Front Construction. Handbook. 6 x 10 in. 32 pp.  
With full size blue print details. 24 x 36 in.

**Kawneer Manufacturing Co.**, Niles, Mich.  
Architects' Portfolio of Details. 17 full size construction plates, loose leaf. 34 x 44 in. Also 17 half size construction plates, bound. 8½ x 11 in.

**Zouri Drawn Metals Co.**, 1817 East End Avenue, Chicago Heights, Ill.  
Zouri Safety Key-Set Store Front Construction. Detail sheet showing sections of construction. 9 x 11 in. 4 pp.

SELECTED LIST OF MANUFACTURERS' PUBLICATIONS — *Continued from page 31*

## STUCCO BOARD

- Bishopric Manufacturing Co., The**, 910 Este Avenue, Cincinnati, Ohio.  
The Bishopric Mastic Products. Booklet. 6 x 9½ in. 24 pp. Color plates.  
Built on the Wisdom of Ages. Booklet showing methods of using Bishopric Stucco Board. 8½ x 11 in. 48 pp.  
"Service Sheets." 16½ x 21½ in.

## TERRA COTTA, ARCHITECTURAL

- American Terra Cotta & Ceramic Co.**, 2010 Peoples' Gas Building, Chicago.  
Specifications for Architectural Terra Cotta and Details of Construction. 14 plates.  
**Atlantic Terra Cotta Co.**, 1170 Broadway, New York.  
Atlantic Terra Cotta. Monthly publication. 9 x 12 in. 12 pp.  
**Conkling-Armstrong Terra Cotta Co.**, Philadelphia.  
Ornament and Details of Construction. Catalog. 9½ x 13 in.  
**Midland Terra Cotta Co.**, 1515 Lumber Exchange Building, Chicago.  
Stock Terra Cotta. Portfolio. 10 x 15 in. 60 plates.  
**New Jersey Terra Cotta Co.**, Singer Building, New York.  
The Victoria Building. Booklet. 8½ x 11 in. 10 pp.  
**New York Architectural Terra-Cotta Co.**, 401 Vernon Avenue, Long Island City, N. Y.  
Architectural Terra Cotta. Booklet. 8 x 8½ in. 36 pp.  
**South Amboy Terra Cotta Co.**, 150 Nassau Street, New York.  
Plates of Ornamental Detail and Construction. Portfolio.

## TILE, HOLLOW

- National Fire Proofing Co.**, 594 Federal Street, Pittsburgh.  
Builders' Handbook. Details of construction. 8½ x 11 in. 34 pp. Blue prints.  
Fireproof Houses of Natco Hollow Tile. Catalog. 8½ x 11 in. 30 pp.  
Long Span Fireproof Floor Construction. Details, tables, tests. Handbook. 8½ x 11 in. 60 pp. Color plates.  
Natco on the Farm. Catalog. 5½ x 7½ in. 50 pp.

## TILE, STEEL

- General Fireproofing Co., The**, Youngstown, Ohio.  
Steel-Tile Handbook. Tables, formulas, specifications, etc., for tile floors and concrete work. 6 x 9 in. 32 pp.  
**Trussed Concrete Steel Co.**, Dept. R-57, Youngstown, Ohio.  
Florestyle Construction. Booklet containing table and full information for specifying. 8½ x 11 in. 16 pp.

## VACUUM CLEANERS

- Sturtevant Co., B. F.**, Dept. B., Hyde Park, Boston.  
Sturtevant Vacuum Cleaners. Handbook for architects. No. 248. 8½ x 11 in. 36 pp.

## VENETIAN BLINDS

- Wilson Corporation, The, J. G.**, 8 West 40th Street, New York.  
The Lighting and Ventilation of Modern Buildings. Treatise with working drawings. 8½ x 11 in. 12 pp.

## VENTILATION

- American Blower Co.**, Detroit, Mich.  
American Sirocco Fans and Blowers. Bulletin. 8½ x 11 in. 52 pp.  
**American Radiator Co.**, 816 So. Michigan Avenue, Chicago.  
"A B C" Steel Plate Fans. Bulletin. 8½ x 11 in. 28 pp. Ventilation by Vento Heaters. Booklet. 8 x 10¼ in. 24 pp.  
**Clarage Fan Co.**, Kalamazoo, Mich.  
Catalog No. 5. 6 x 9 in. 26 pp.  
**Globe Ventilator Co.**, Dept. P, Troy, N. Y.  
Booklet. 4 x 9 in. 36 pp.  
**Ohio Blower Co., The**, 5119 Perkins Avenue, Cleveland.  
Gospel of Fresh Air. Booklet. 4 x 9 in. 24 pp.  
**Sturtevant Co., B. F.**, Dept. B, Hyde Park, Boston.  
Sturtevant Heaters. Catalog, containing data, curves, tables, and complete layouts for the use of architects in specifying heating and ventilating systems. 8½ x 11 in. 132 pp.  
Auto Force Ventilators. Bulletin No. 232. 8½ x 11 in. 12 pp.

## WALL BOARD

- Carey Co., The Philip**, Lockland, Cincinnati.  
Carey "Ceil-board" for Walls and Ceilings. Specifications. 8 x 11 in. 2 pp.

## WALL COVERINGS

- Standard Oil Cloth Company, Inc., The.**, Dept. I, 320 Broadway, New York.  
Sanitas Modern Wall Covering. Booklet. 5 x 7 in. 28 pp. Color plates.  
Hints to Decorators. Booklet. 5 x 7 in. 12 pp. Colored inserts.  
What They Say About Sanitas. Booklet. 5 x 7 in. 27 pp.  
Selling Helps. Booklet. 5 x 7 in. 24 pp.

## WATERPROOFING

- Anti-Hydro Waterproofing Co.**, 9 Orchard Street, Newark, N. J. (Singer Building, N. Y. C.)  
Concrete Hardener Waterproofing. Booklet. 6½ x 8¼ in. 8 pp.  
**General Fireproofing Co., The**, Youngstown, Ohio.  
Waterproofing Handbook. 6 x 9 in. 88 pp.  
**Sandusky Cement Co., The**, Dept. S, Engineers' Building, Cleveland, Ohio.  
Medusa Waterproofing. Booklet. 7 x 9 in. 36 pp.  
**Sonneborn Sons, Inc., L.**, Dept. 4, 264 Pearl St., New York.  
Concrete and Lapidolith. Treatise on concrete construction and the use of Lapidolith with it. 5¼ x 8¼ in. 20 pp.  
**Toch Brothers**, Dept. 97, 320 Fifth Avenue, New York.  
"R. I. W." Toxement (Patented). Booklet. 5¼ x 8 in. 28 pp.  
**Trus-Con Laboratories, The**, 1246 Trus-Con Building, Detroit, Mich.  
Architects' Handbook. 8½ x 11 in. 36 pp.  
Structural Waterproofing. 8½ x 11 in. 52 pp.  
Agatex Book. 5½ x 8 in. 18 pp.  
Descriptive Price List. 3½ x 6¼ in. 24 pp.  
**Wadsworth, Howland Co., Inc.**, 139 Federal Street, Boston.  
Bay State Brick and Cement Coating. Booklet No. 10. Color plates.

## WATER SYSTEMS

- Armstrong Cork & Insulation Co.**, 132 24th St., Pittsburgh.  
Drinking Water Systems. Treatise. 6 x 9 in. 48 pp.

## WINDMILLS

- Corcoran, Inc., A. J.**, 763 Jersey Avenue, Jersey City, N. J.  
Windmills. Booklet.

## WINDOWS, CASEMENT

- Crittall Casement Window Co.**, Detroit, Mich.  
Universal Casements. Catalog No. 15, showing solid steel casement windows. Details. 9¼ x 12 in. 64 pp.  
**Hope & Sons, Henry**, 103 Park Avenue, New York.  
Casement Windows. Details and sections. Catalog. 10 x 15 in. 187 pp.  
**International Casement Co., Inc.**, Jamestown, N. Y.  
Casement Windows and Leaded Glass. Catalog. 10 x 14 in. 56 pp. Plates showing 16th century Tudor residences.

## WIRE FENCES

- Wright Wire Company**, Worcester, Mass.  
Excelsior Rust Proof Fencing. Illustrated and descriptive booklet. 3½ x 6 in. 16 pp.

## WOOD

- Gum Lumber Manufacturers' Association**, 1304 Bank of Commerce Building, Memphis, Tenn.  
Red Gum Facts. Catalog. 5½ x 8½ in. 20 pp.  
Technical Information about Red Gum. Catalog. 5¼ x 9 in. 20 pp.  
**North Carolina Pine Association**, 83 Bank of Commerce Building, Norfolk, Va.  
Architects' Reference Book. Booklet. 8½ x 11 in. 16 pp. Color plates.  
Home Builders' Book. 5 x 9 in. 24 pp. Color plates.  
**Northern Hemlock and Hardwood Mfr's Assn.**, 205 F. R. A. Building, Oshkosh, Wis.  
Birch Interiors. Booklet. 9¼ x 12 in. 46 pp.  
Beautiful Birch for Beautiful Woodwork. Leaflet. 8½ x 11½ in.  
Serviceability and Qualities of Birch. Booklet. 8½ x 11 in. 7 pp.  
Rules for the Inspection of Hemlock Lumber. Booklet. 3½ x 6¼ in. 32 pp.  
**Southern Cypress Manufacturers' Association**, 1234 Hibernia Bank Building, New Orleans.  
Cypress Pocket Library. Covers all uses for cypress. 41 units. 3¼ x 5½ in.  
**Southern Pine Association**, Dept. H-61, Interstate Bank Building, New Orleans, La.  
Rules for Grading Southern Yellow Pine Timbers. Treatise. 3½ x 6 in. 24 pp.  
Creosoted Wood Block Floors. Booklet. 7 x 10 in. 32 pp.  
Directions for Furnishing Southern Yellow Pine. Technical booklet. 7 x 10 in. 20 pp.  
Manual of Standard Wood Construction. Scientific handbook. 4½ x 6½ in. 150 pp.  
**White Pine Bureau**, 1830 Merchants Bank Building, St. Paul, Minn.  
Specification Book—Classified Recommended Uses for White Pine. Illustrating the various standard grades and indicating their proper uses. 8½ x 11 in. 196 pp.  
Three Story Houses of New England. Architectural monograph. Vol. III, No. 1. 8½ x 11 in. 16 pp.  
Early Wooden Architecture of Andover, Mass. Monograph. Vol. III, No. 2. 8½ x 11 in. 16 pp.  
Old Houses of Newburyport, Mass. Monograph. Vol. III, No. 3. 8½ x 11 in. 16 pp.



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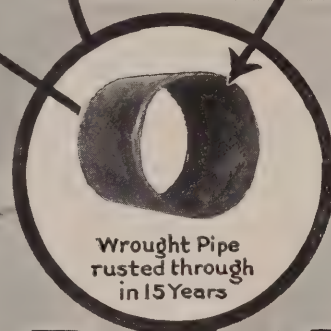
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| Sanitary Co. of America . . . . .              | Linfield, Pa.       | Casey-Hedges Co., The . . . . .       | Chattanooga, Tenn. |
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## HOTEL RAYMOND

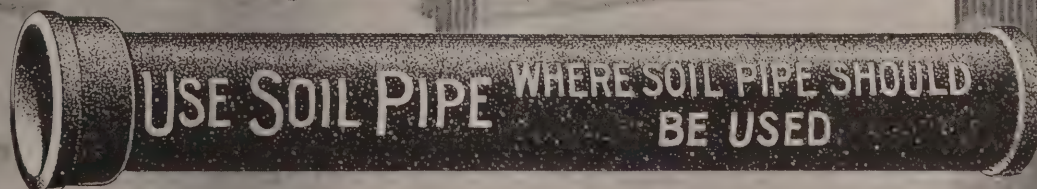
One of the show places of Pasadena, California has already outlived the wrought pipe in its drainage system.

The pipe pictured above is a photograph of a 4-inch nipple that pitted, rusted through, and caused a bad leak over the ceiling of one of the guest rooms.

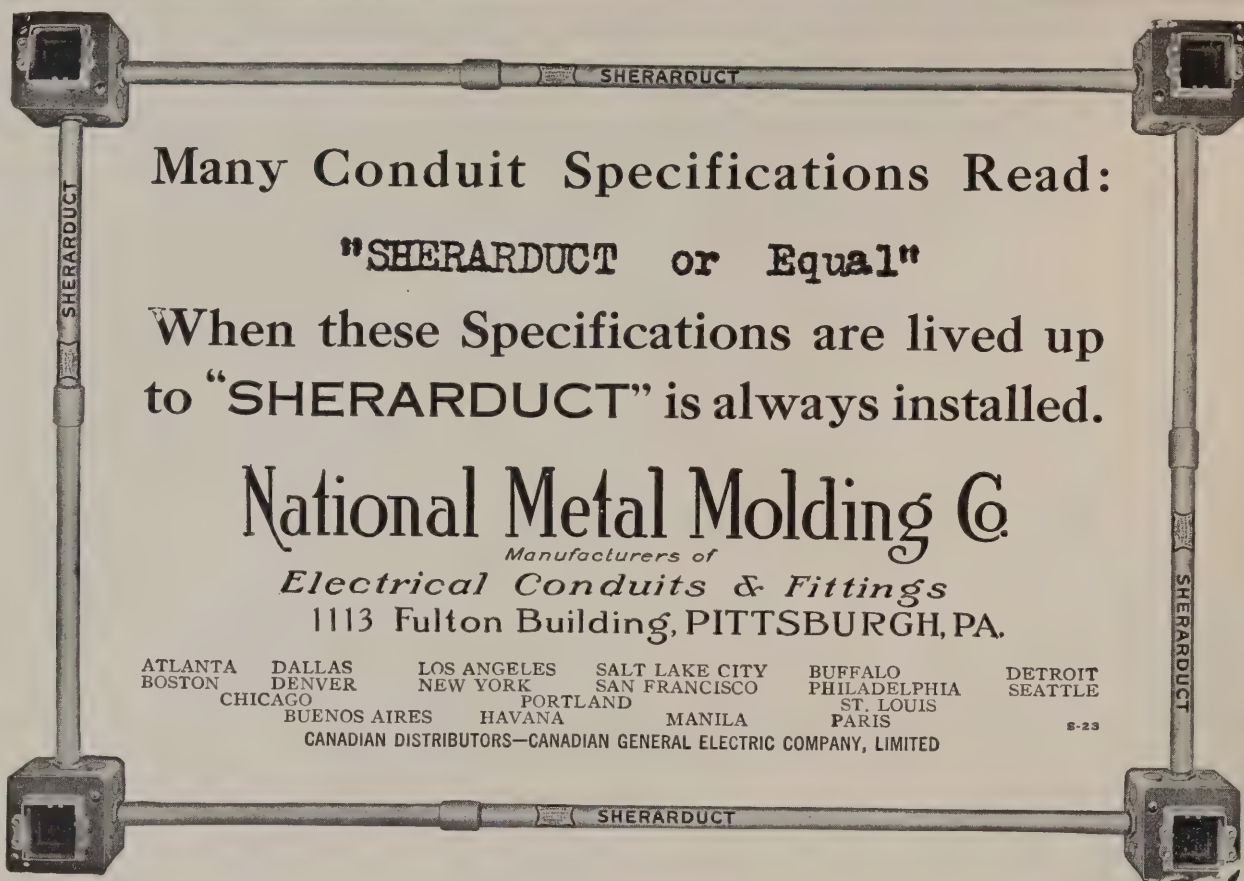
The hotel was erected in 1902—the wrought pipe was torn out early this year.

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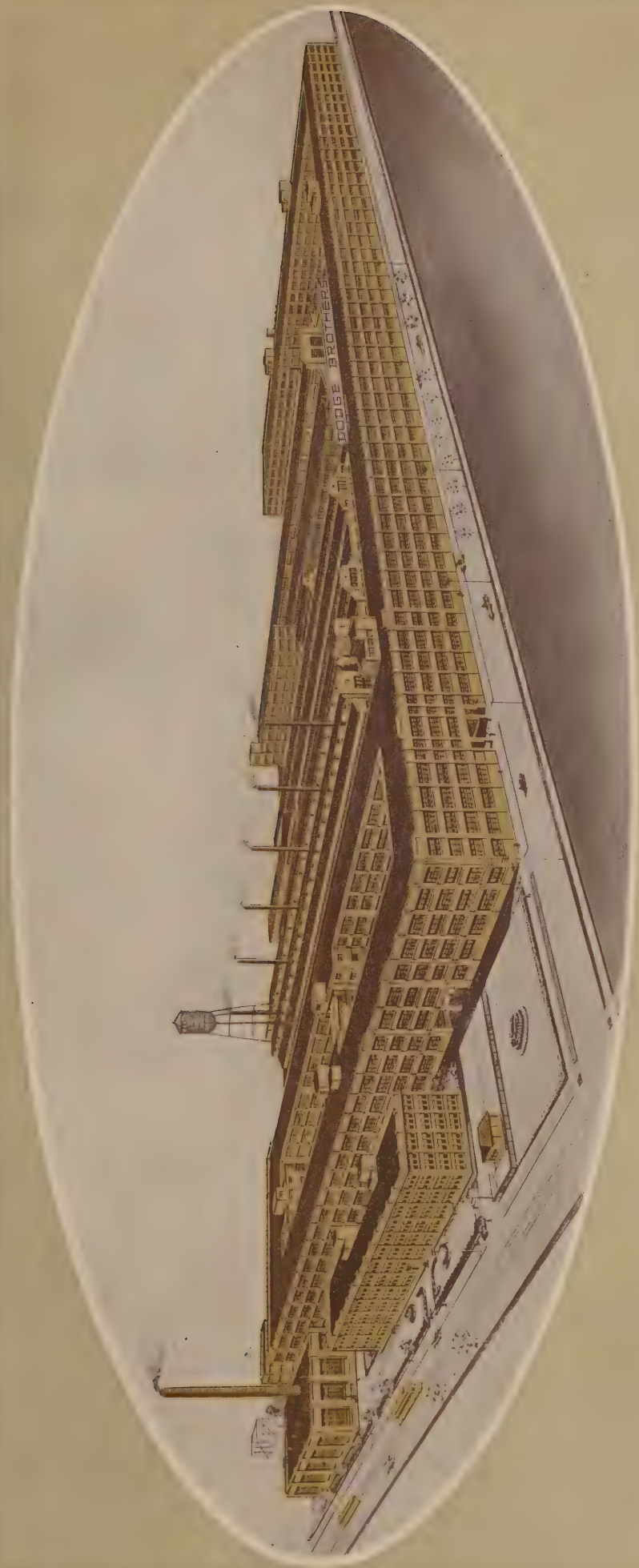
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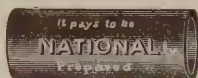
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Detroit, Michigan

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DETROIT, MICHIGAN

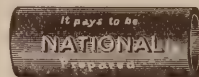
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Complete information about "NATIONAL" Pipe may be found on pages 1339-1351, inclusive, of the 1917 edition of Sweet's Catalogue.

This is the sixth of a series of "NATIONAL"ized buildings as follows:

- THE UNION ARCADE, Pittsburgh, Pa.  
American Architect, Feb. 21st, pages 60-61.  
Architectural Forum, March, pages 41-52.  
Buildings & Building Management, May, pages 23-24.
- THE EQUITABLE BUILDING, New York, N. Y.  
American Architect, March 21st, pages 19-20.  
Architectural Forum, April 1st, pages 35-36.

CONTINENTAL & COMMERCIAL NATIONAL BANK BUILDING, Chicago, Ill.

- American Architect, May 2nd, pages 21-22.
- Architectural Forum, May, pages 45-46.
- Buildings & Building Management, June, pages 23-24.

HOTEL TRAYMORE, Atlantic City, N. J.  
Architectural Forum, June, pages 39-40.  
Buildings & Building Management, July, pages 23-24.

JOHN WANAMAKER COMPANY Building, Philadelphia, Pa.  
Architectural Forum, July, pages 33-34  
Buildings & Building Management, August, pages 23-24.

¶ To readily identify "NATIONAL" material and as protection to manufacturer and consumer alike, the practice of National Tube Company is to roll in raised letters of good size on each few feet of every length of welded pipe the name "NATIONAL" (except on the smaller butt-weld sizes, on which this is not mechanically feasible) on these smaller butt-weld sizes the name "NATIONAL" appears on the metal tag attached to each bundle of pipe.

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¶ In addition, all sizes of "NATIONAL" welded pipe four in. and under are subjected to a roll-knobbling process known as Spellerizing to lessen the tendency to corrosion, especially in the form of pitting. This Spellerizing process is peculiar to "NATIONAL" pipe, to which process, National Tube Company has exclusive rights.

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(See preceding page for illustration)





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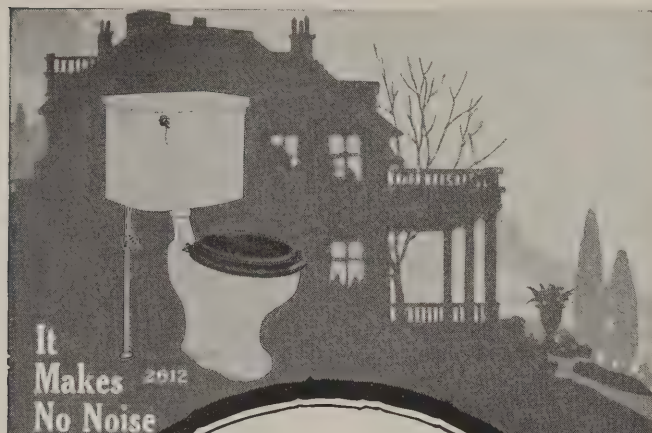
★ The stars indicate the location of the KOHLER permanent trade-mark in faint blue.



"Bevo" Lavatory—Plate F-275-P

"Viceroy Bath"—Plate V-12 (Patent Applied for and Name Reg. U. S. Pat. Off.)





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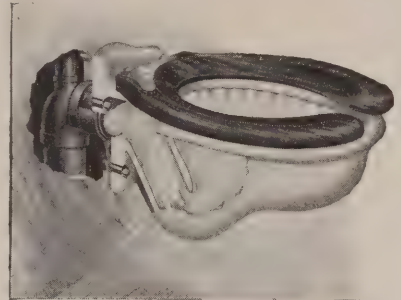
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Watrous Duojet Floor Closet. Note the two converging jets and straight outlet passage

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Watrous Duojet Wall Closet. Sectional view showing method of support

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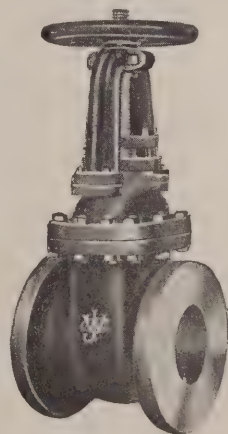
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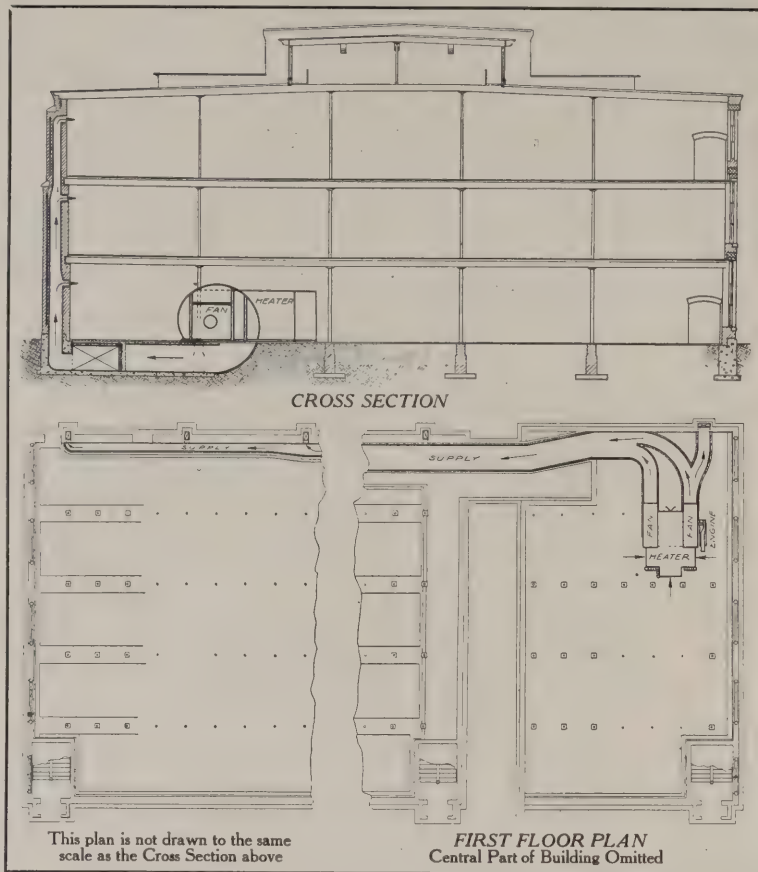
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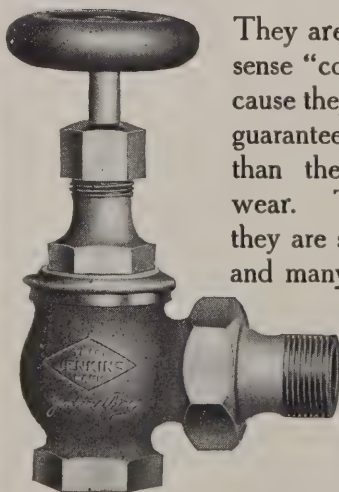
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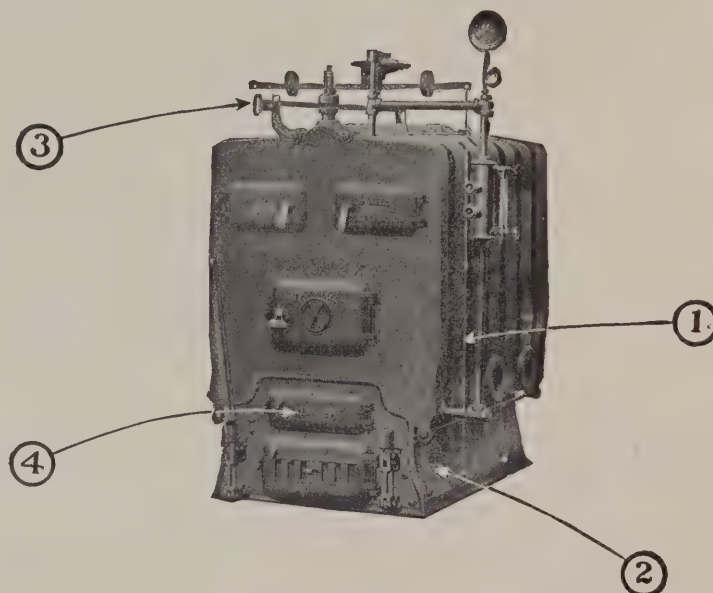
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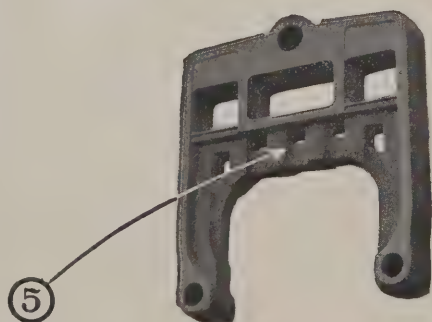
# CAPITOL BOILERS

## Square Sectional Type

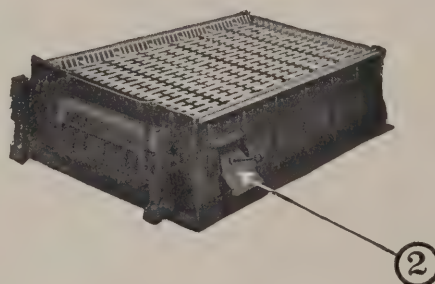


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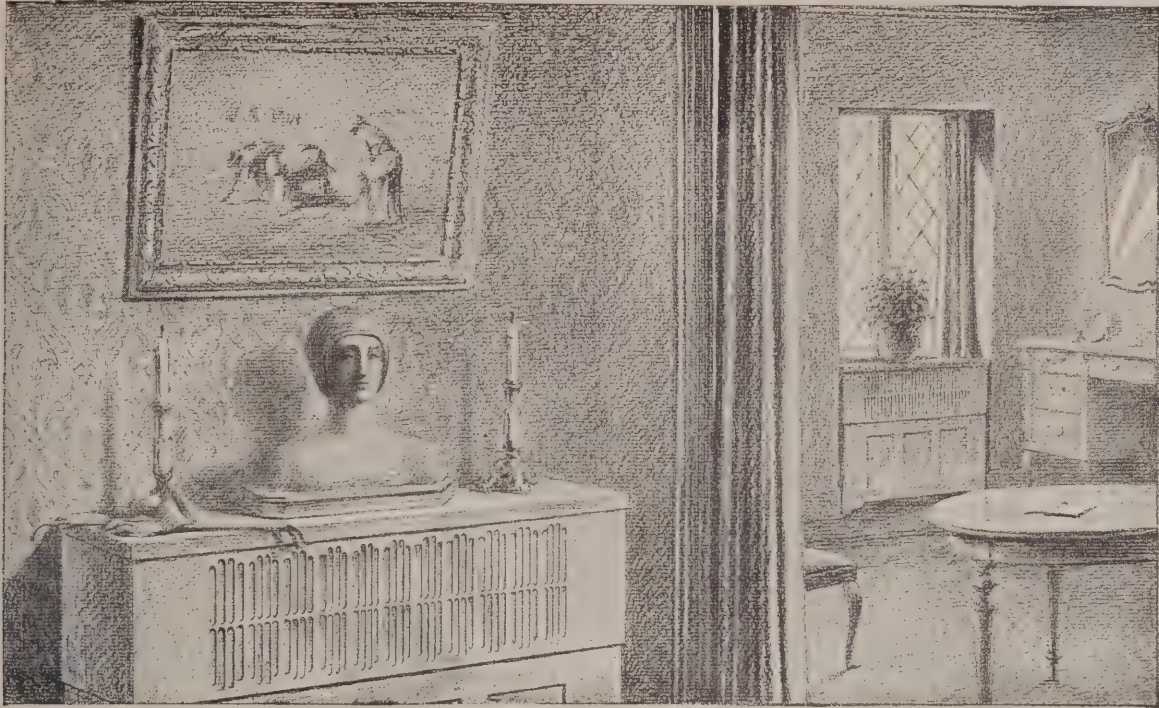
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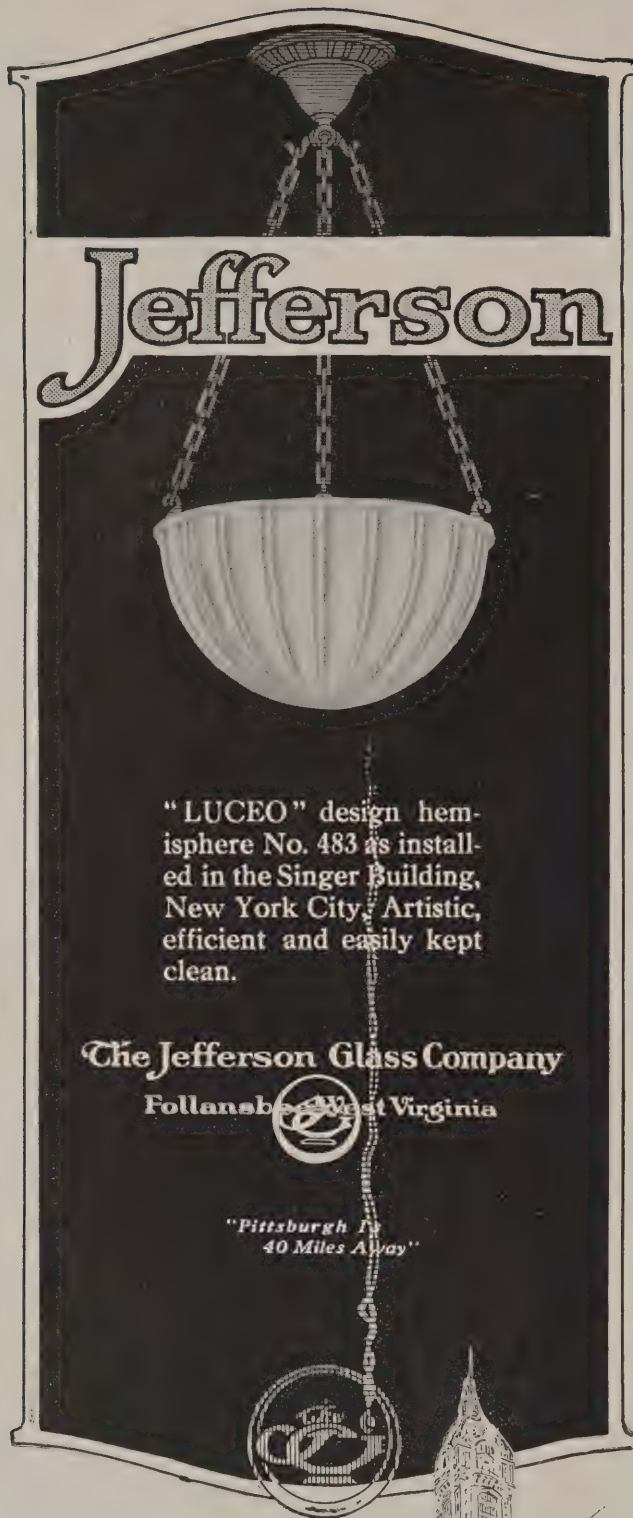
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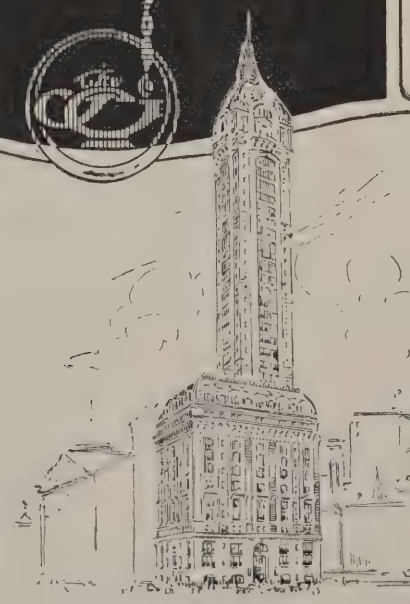


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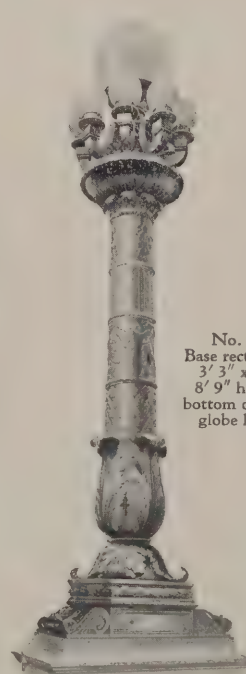
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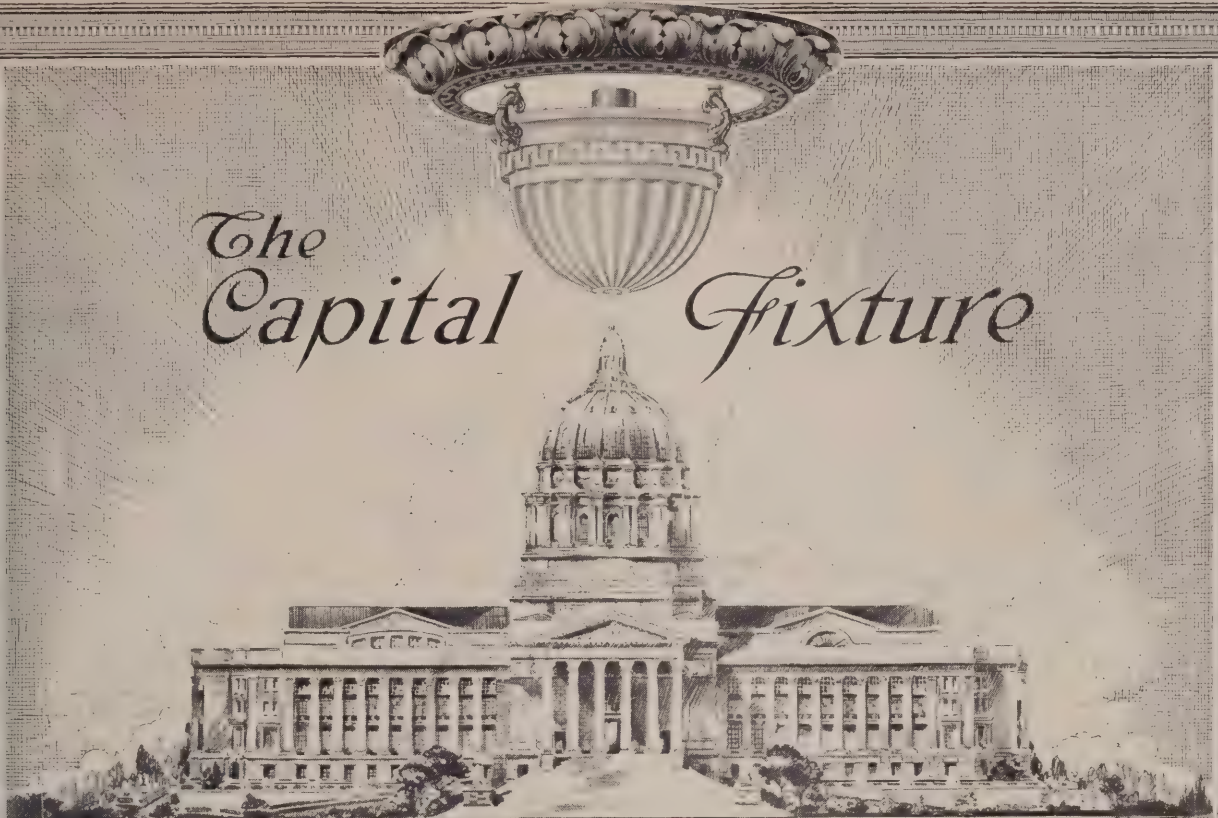
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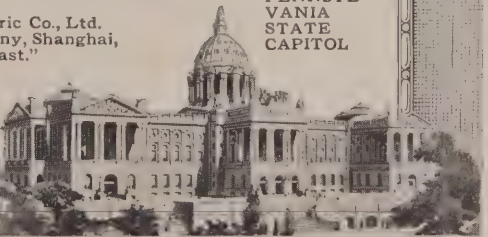
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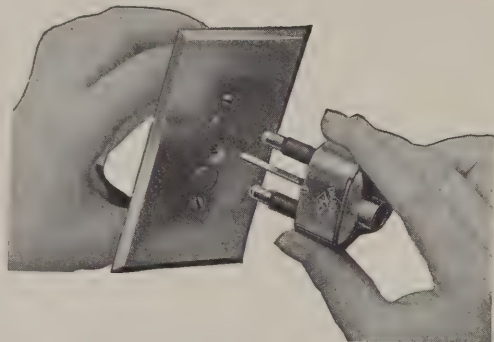
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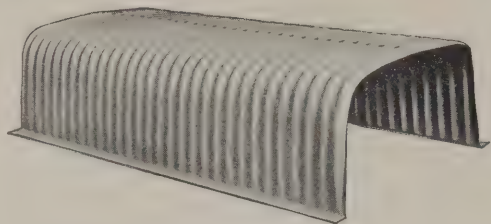
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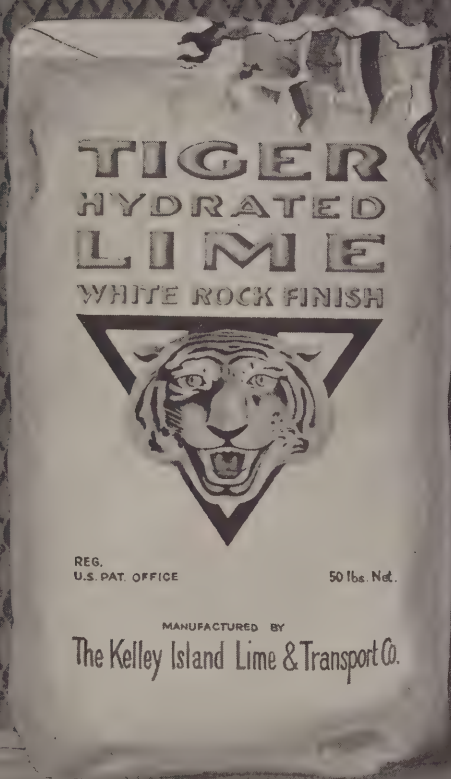
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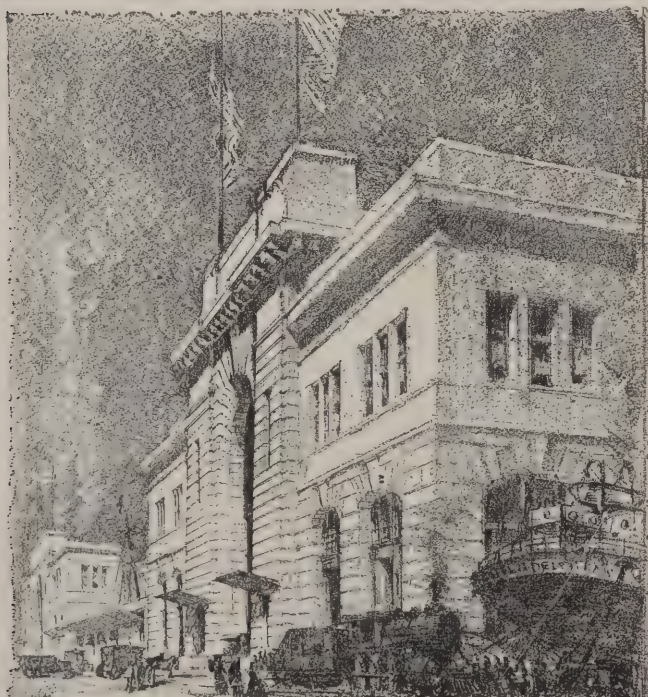
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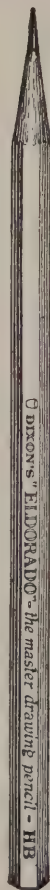
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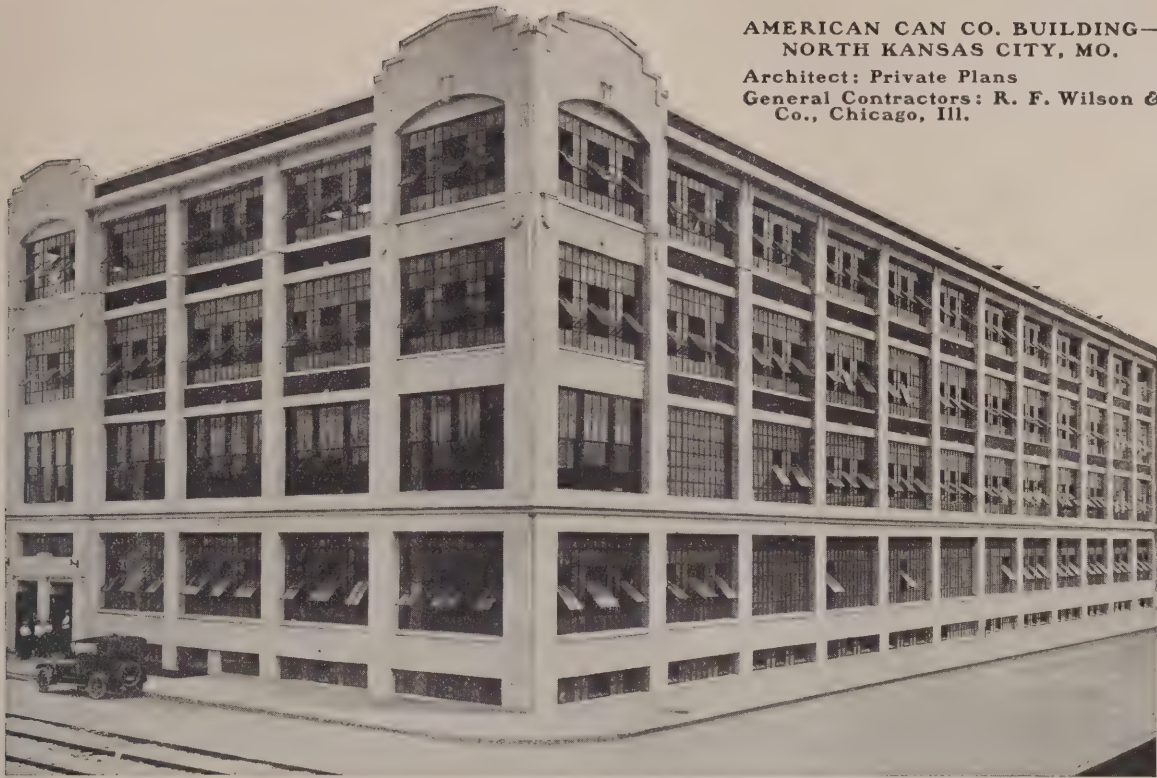
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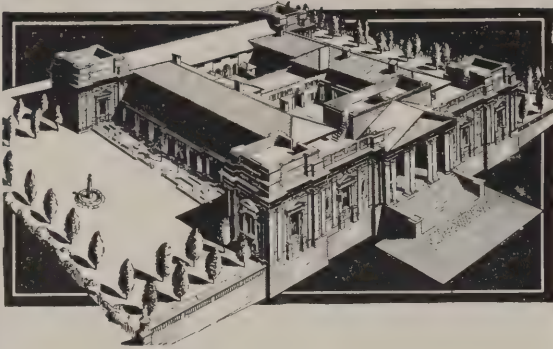
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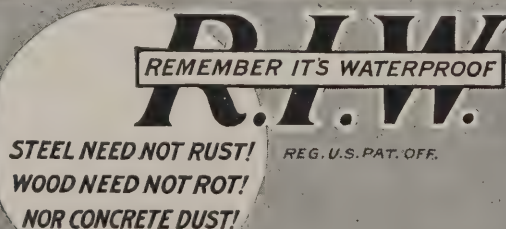
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*Economy*—Moderate first cost. Low maintenance, depreciation charges and insurance. Ultimate costs are extremely low.

*Architectural Treatment*—Real opportunities for good architectural effects in concrete industrial buildings—and good design is gradually winning recognition from practical business men.

In brief—no field now offers so much to the architect as reinforced concrete construction.

## Atlas service for architects

We will gladly furnish information on reinforced concrete and co-operate upon request in developing designs. Factory construction book on request. Use the coupon below.

### The Atlas Portland Cement Company

*Member of the Portland Cement Association*

New York Chicago Phila. Boston St. Louis Minneapolis Des Moines Dayton Savannah

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# ATLAS CEMENT

THE ATLAS PORTLAND CEMENT COMPANY, 30 Broad St., N. Y., or Corn Exchange Bank Bldg., Chicago. Send book on Industrial Buildings and information about Atlas Service to name and address written on margin, particularly subjects checked.

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If you will state kind of business for which building is intended \_\_\_\_\_ special information will be furnished.





F. T. Blake Residence, Worcester, Massachusetts

*Medusa Waterproofed White Portland Cement Exterior on Hollow Tile*

L. W. Briggs Co., Architects

Faucher Bros. & Co., Plastering Contractors

## That Keenest of Satisfactions—

the consciousness of work well done—is one of the chief reasons why you should specify Medusa Waterproofing.

The integral method of waterproofing appeals to men who have the instinct of workmanship. It fulfils that desire for permanence and finality that every sincere architect must feel and want to incorporate in his work.

# MEDUSA WATERPROOFING

PATENTED PASTE AND POWDER

offers no technical problem to the builder. It does not impair or modify the color, strength or setting of cement or concrete. Its two forms, paste and powder, make it convenient to use. The steadily increasing use of Medusa Waterproofing for important buildings of every type is significant. Buildings that were water and dampproofed with Medusa Waterproofing ten years ago are proving that it is a permanent waterproofing medium.

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beyond question. If a structure should be waterproofed, the only logical, effective and economical way is to waterproof it once for all.

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Foundations waterproofed with Medusa Waterproofing will remain dry enough to strike a match on the interior walls even under ten to twenty foot heads of water.

**The booklet "Medusa Waterproofing" will give you accurate, conservative data about all of the principal uses of Medusa Waterproofing. May we send it?**

THE SANDUSKY CEMENT COMPANY, Dept. S, Cleveland, U. S. A.





William Penn  
Hotel  
Pittsburgh  
Pa.



Swimming-  
Pool of  
J. F. Carlston  
Oakland, Cal.

## Two Widely Contrasted Examples of GF Waterproofing Service

The first picture shows the William Penn Hotel of Pittsburgh. GF No. 10 Integral Waterproofing Paste was used for waterproofing the concrete.

The second picture is that of an outdoor swimming-pool on the beautiful estate of J. F. Carlston, Oakland, Cal. GF No. 10 was used on the interior of the pool.

GF No. 10 is a smooth, white Waterproof-

ing Paste which is first dissolved in the gauging water and then carried into every void in the concrete mixture that the water itself penetrates.

Upon contact with the constituents of cement the waterproofing paste forms a chemical compound which renders all the little pores in the concrete mass permanently water-repellent.

# GF WATERPROOFINGS

Its absolute solubility in water insures uniform distribution throughout the mass. It forms with cement a perfect and permanent waterproofing, and in no way affects the set or strength of concrete. It is so simple to use that it reduces labor cost and eliminates imperfections due to careless workmanship. It is a great deal more satisfactory and about ten times as cheap to waterproof the

concrete while it is being mixed than after the job is completed.

GF No. 10 Integral Waterproofing Paste is only one of the 23 GF Waterproofing materials which together constitute a service equal to all waterproofing and concrete hardening problems that may arise in the experience of the architect or engineer.

*They are covered comprehensively by the GF "Waterproofing Handbook." Free to any interested architect or engineer.*



**THE GENERAL FIREPROOFING COMPANY, Youngstown, Ohio**

Manufacturers of all types of Metal Lath, Concrete Reinforcements, and Waterproofings

Branch Offices: New York City, Chicago, Philadelphia, San Francisco, Kansas City, Atlanta, Cincinnati, Buffalo, Utica  
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## CONVINCERS

A railroad lead is a safe lead to follow when it comes to building construction. They investigate deeply, test out thoroughly and do not "guess" at results. This is particularly true in concrete floor work, for the wear and tear they give such floors make it imperative that they be right from the start. Delays and repairs are expensive. Dust is objectionable. Hence they eliminate these when the floor is laid by using Master Builders Method with Master Builders Concrete Hardner.

Such was the case at the Terminal Building, Macon, Ga., shown above. This has 38,000 sq. ft. of Masterbuilt floors. Alfred Fellheimer, New York, was the architect and Henry Miller, Inc., Baltimore, the contractor.

### Master Builders Method

is widely used for express and freight platforms, ramps, driveways, floors in shops, stations, warehouses, etc. — wherever the ability to stand up under hard service is demanded — by railroads in all parts of the country. Among such users are:

|                                     |                                          |
|-------------------------------------|------------------------------------------|
| <i>Big Four Railway Co.</i>         | <i>N. C. &amp; St. Louis Railway Co.</i> |
| <i>Canadian Pacific Railway Co.</i> | <i>New York State Railway Co.</i>        |
| <i>Erie Railway Co.</i>             | <i>Northern Central Railway Co.</i>      |
| <i>Grand Trunk Railway Co.</i>      | <i>Pennsylvania Railway Co.</i>          |
| <i>New York Central Railway Co.</i> | <i>Wheeling &amp; Lake Erie Ry. Co.</i>  |

This Method has not come to be the standard of construction for concrete floors through chance. It occupies its preeminent position to-day because it is the Method that absolutely insures a wearproof, dustproof and waterproof concrete floor — and more than 21,000 users, with over 80,000,000 sq. ft. in use, prove this.

*Whether architect, engineer or contractor, if you are not to-day utilizing the many advantages of Master Builders Method, let it not be because you are not fully informed what those advantages are. For the coupon will bring facts quickly. Sign and mail it.*

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Makers of Master Builders Concrete Hardner, Master Builders Red Concrete Hardner, Master Builders Black Concrete Hardner, Roadyte, Concrete Hardner for Concrete Roads, Master Builders Saniseal, Liquid Concrete Hardner

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*This is the seventh of a series of Master Builders Method installations that prove convincingly its foremost place as the standard of construction for concrete floors.*

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To architects who have not yet specified Lapidolith we offer Lapidolith as a proven remedy for concrete floor troubles. Specify

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This liquid, colorless chemical is readily flushed on under our supervision. It is guaranteed to dustproof, wearproof and waterproof old or new concrete floors.

After a floor is set it needs Lapidolith to prevent disintegration.

Department 4

## L. SONNEBORN SONS, INC.

Manufacturers of Cemcoat  
the Washable Wall Coating

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The graphic features the word "INDIANA" in a stylized, cursive font at the top. Below it, the word "LIMESTONE" is rendered in large, bold, block letters. The letters of "LIMESTONE" are filled with a detailed illustration of various industrial and architectural structures, including factories, bridges, and classical buildings. Below the word "LIMESTONE", the phrase "The ARISTOCRAT of BUILDING MATERIALS" is written in a smaller, elegant serif font.

# INDIANA LIMESTONE

*The* ARISTOCRAT of BUILDING MATERIALS

Indiana Limestone trim adds the modern touch of beauty to factories and other

## Industrial Buildings

Many excellent examples of this use of Indiana Limestone exist in many cities, and architects who thus once use it almost invariably continue to specify it. It is used with every other material.

The low cost of Indiana Limestone especially in the simpler decorative forms and in turned work such as columns, balusters, urns and the like often enables the architect to give his commercial client a finer effect than the client expects for his money—an achievement so rare as to be attractive to even the most skillful members of the profession.

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*Samples of Indiana Limestone, the soundly written booklet Volume 1 of the Limestone Library, and all possible co-operation and information are yours on request.*

Indiana Limestone Quarrymen's Association

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AN ARCHITECTURAL VOLUME *of* UTMOST VALUE

# SMALLER ITALIAN VILLAS & FARMHOUSES

By GUY LOWELL

ILLUSTRATED BY PHOTOGRAPHS AND SKETCHES  
MADE BY THE AUTHOR AND BY OTHERS

THIS book is the fruit of several trips to Italy, made with the object of studying the artistically important but comparatively little known smaller *maisons de plaisance* in Italy. Most of the books on Italian Villas that have been published are more especially devoted to romantic or historical anecdotes of the great villa-building churchly and princely families, or else devote themselves more especially to the gardens, which, though charming, are after all but a part of the complete villa or country estate. In Italy the country villa has for centuries been used more as a place for rest, recreation, and refreshment from the heat of the city than as an income-producing landed estate and, accordingly, Italy is full of charming country houses, many of which are unknown to the writer of guide books or to the dealers in architectural photographs.

A large proportion of the cuts in this book consists of absolutely new material, for they show the Italian country estate of the Renaissance in all its parts,—house, garden, terracing, and the outlying *podere* or farm as well,—for it is in these smaller buildings, scattered in picturesque sites, always skilfully adapted to the surrounding landscape, that we find many admirable examples of small house architecture.

Though this book consists largely of photographs and sketches of little known villas, it contains, none the less, views and plans of some of the better known and frequently published ones, for it is believed that it will then make the best sort of reference book for the architect, and provide the best sort of inspiration for all those who have felt the enchantment of life on a country estate.

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GILT TOP, CONTAINING 125 PLATES, SIZE 12 x 16 INCHES  
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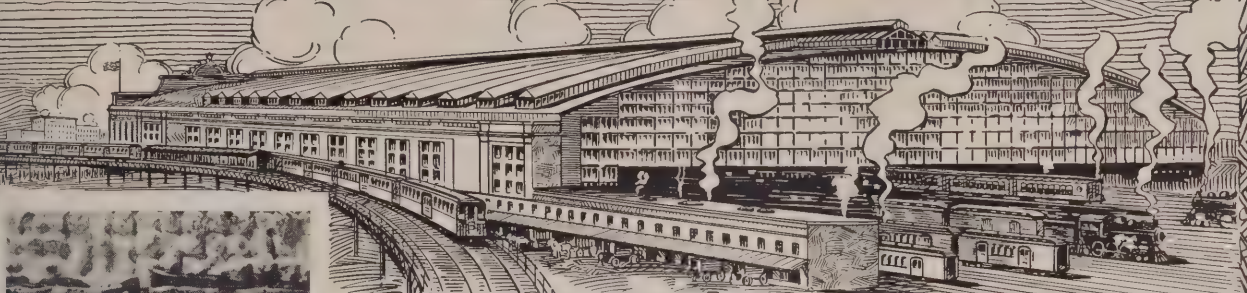
## ROGERS & MANSON COMPANY

ARCHITECTURAL PUBLISHERS

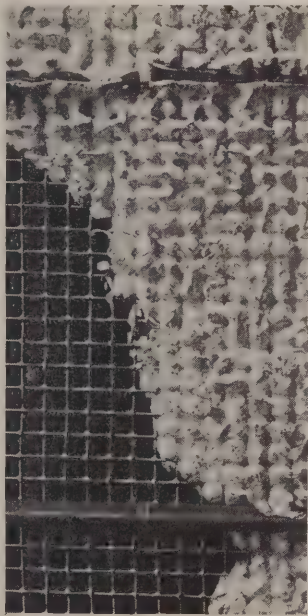
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# THE TEST OF TIME



100,000 Sq. Yds. of  
WRIGHT WIRE LATH here



THE South Station, Boston, has been standing for nearly twenty years. During this time, every day for twenty-four hours, the walls have been subjected to an almost continuous vibration of the most severe kind—not alone from the trains within the shed, but from the elevated trains on the street side as well.

That these walls have nobly stood this strain is attested by the condition of the plaster to-day, proving beyond dispute that Wright Wire Lath,

carrying plaster properly put on, makes walls of permanency.

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The little illustration at the left shows how the plaster keys on to Wright Wire Lath. This shows the back side and fully illustrates the fact that the plaster completely embeds the lath, making a solid, stone-like wall with an iron core. There is no exposed metal to be acted upon by the elements, causing rust and a final disintegration of the wall itself.

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Wright Wire Lath is supplied in rolls 50 yards long and 1 yard wide; three finishes, — plain, japanned and galvanized.

*Send for Booklet L, Architect's Service Sheet, and ask us any questions that might come into your mind on the subject*

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# THE STEEL BROKE FIRST

**T**HIS highly important test, conducted by the Philadelphia Bureau of Building Inspection, was made to determine the allowable strength of concrete slabs when reinforced with Chanelath, using various types of aggregate, and also whether the *bond* of painted *Chanelath* to the concrete was sufficient to develop the full strength of the steel.

As in the other tests, shown in two preceding issues, the slabs were loaded uniformly with pig-iron until broken.

It is noteworthy that *the steel broke first*, and *only* at exceedingly high unit stress, the minimum being nearly 50% more than the usual ultimate strength of medium steel reinforcing rods.

This test proves conclusively that the T-ribs of *Chanelath*

even when painted, develop a highly efficient bond with the concrete—more than sufficient to develop the full strength of the steel; and the tests clearly indicate that the steel will break before the concrete and steel bond is broken. Architects are referred to the interesting tabulation of all three tests—computations made by Mr. Otto H. Gentner, Jr., Consulting Engineer, Philadelphia. They will be sent upon request.

## NORTH WESTERN EXPANDED METAL CO.

Members of the Associated Metal Lath Manufacturers

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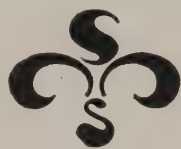
CHICAGO, ILL.

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COPPER STEEL

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represent the highest standard of manufacture and assure the user the utmost of satisfactory service and resistance to rust. When you are paying the price of good galvanized sheets, you should be getting APOLLO-KEYSTONE. Actual time and service tests have proved the superiority of copper steel sheets. Specify *APOLLO-KEYSTONE for Roofing, Cornices, Spouting, Gutters, etc.*

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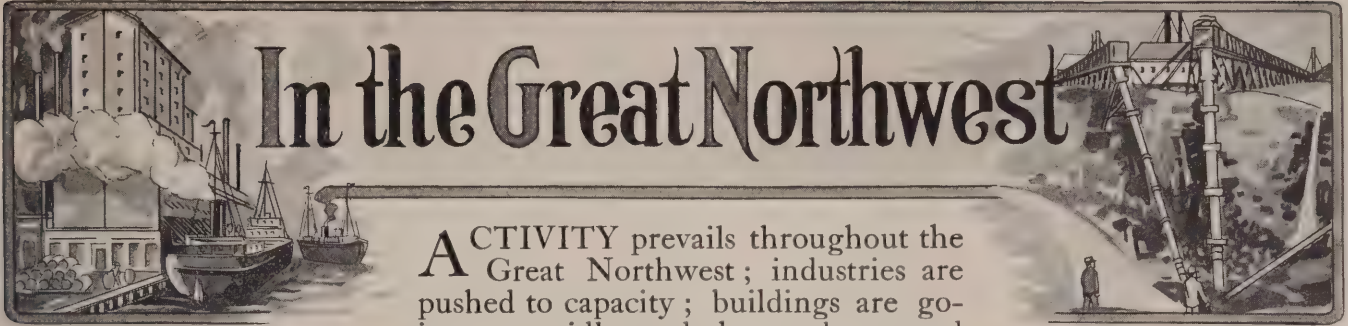
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# In the Great Northwest

ACTIVITY prevails throughout the Great Northwest; industries are pushed to capacity; buildings are going up rapidly, and the modern trend to build for safety and permanency is being carried out.

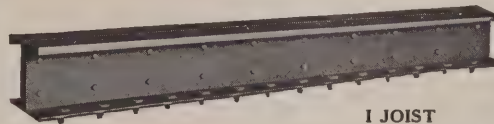
## Berger's *Metal Lumber*

(Patented)

has been used in many types and sizes of buildings throughout this section because of its safety, strength, ease of erection, adaptability, permanency and economy.

This fireproof system has characteristic advantages: prevents the unsightly cracking of plaster finishes; leaves no place for habitation or spread of rodents and vermin; eliminates maintenance costs due to depreciation; and lowers insurance rates.

Every architect should have a copy of Technical Bulletin 12-F. Send for it.



I JOIST

See Sweet's, pages 244-250

## The Berger Mfg. Company

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Branches: Boston New York Philadelphia Chicago  
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Sacred Heart Academy, Fargo, N. D.  
Architect, George Studahar



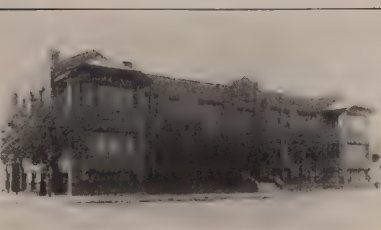
Sacred Heart Academy  
Construction View



Elks' Club, Devil's Lake, N. D.  
Architects, Holmboe & Lafferty



Tribune Building, Great Falls, Mont.  
Architect, Henry Hall Johnson



La Due Court, Williston, N. D.  
Architect, Robert B. Stacy Judd



High School, Ogden, Ia.  
Architects, Alban & Lockhart



Great Northern Hotel Annex, Williston, N. D.  
Designer and Contractor, George Espen



Mitchell Realty Building, Mitchell, S. D.  
Architect, W. W. Beach



Universal Automobile Co., Crete, Neb.  
Architect, G. A. Berlinghoff



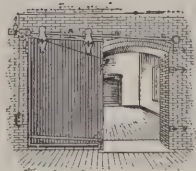
F. W. Cook Building, Fargo, N. D.  
Architects, Ashelman & Gauge



Johnson School Building, Cedar Rapids, Ia.  
Architects, Dieman & Fiske



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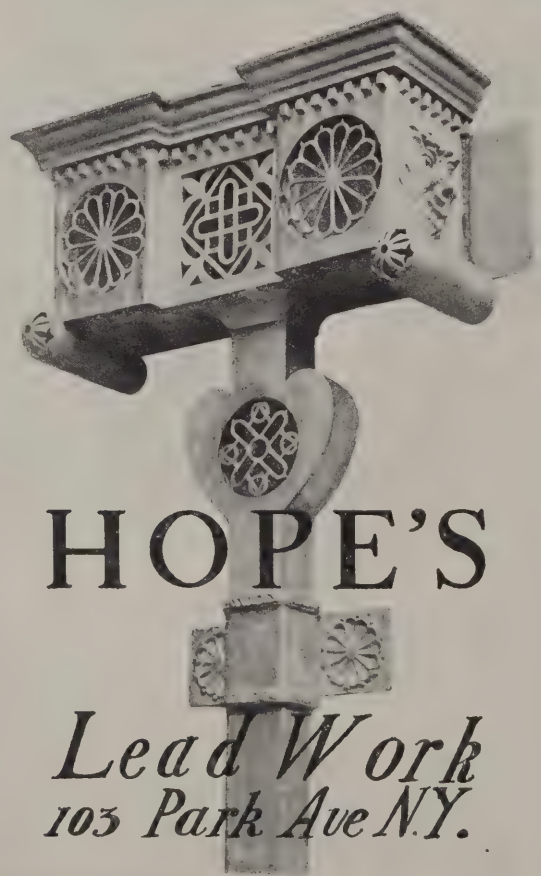
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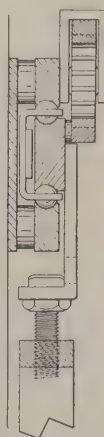
Manufacturers Cleveland, O., U. S. A.



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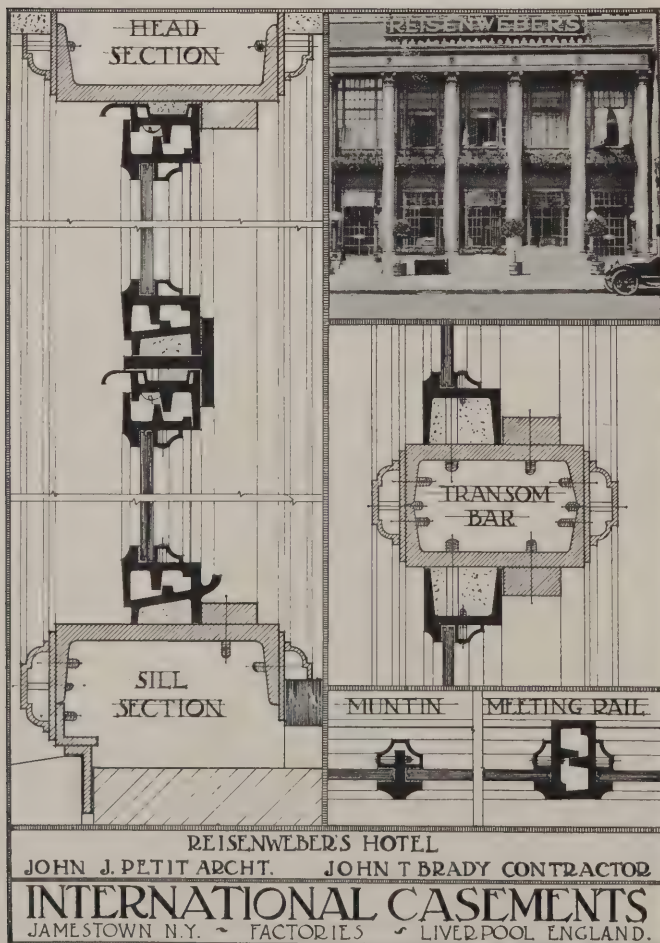
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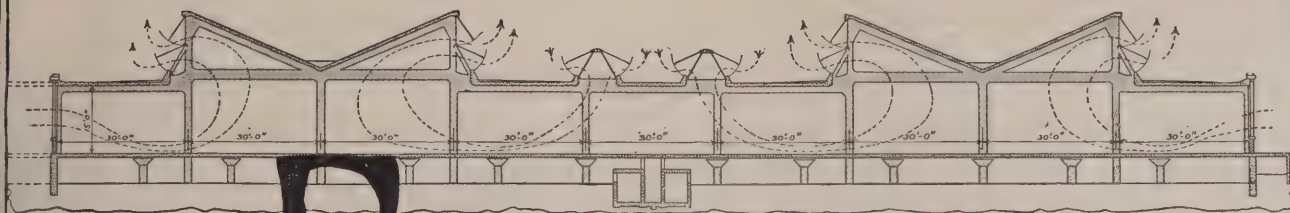
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**I**TS product is the Delco Light for country homes. For the skill and rapidity required of the workers, abundant fresh air and light are necessary.

There is not a dim or stuffy corner in the building. Yet it will be, eventually, six times its present size, or 870 by 2000 feet, all under one continuous forty-acre roof!

Both outlets and inlets are protected by weather-proof lines of top-hung Pond Continuous Sash, operated in unbroken lines of 400 and 600 feet by Pond Operating Device, Motor Driven. Being of equal area, they insure uniform air renewal over the entire floor.

A building thus designed presents obvious economies in reduced wall construction, lessened heating cost, and concentration of all manufacturing processes. As such the design is capable of wide application.

*This and other industrial buildings where our cooperation with the architect or engineer has produced unusual results are described in a booklet, "Air, Light and Efficiency." It's free.*

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Witte and Tulip Streets

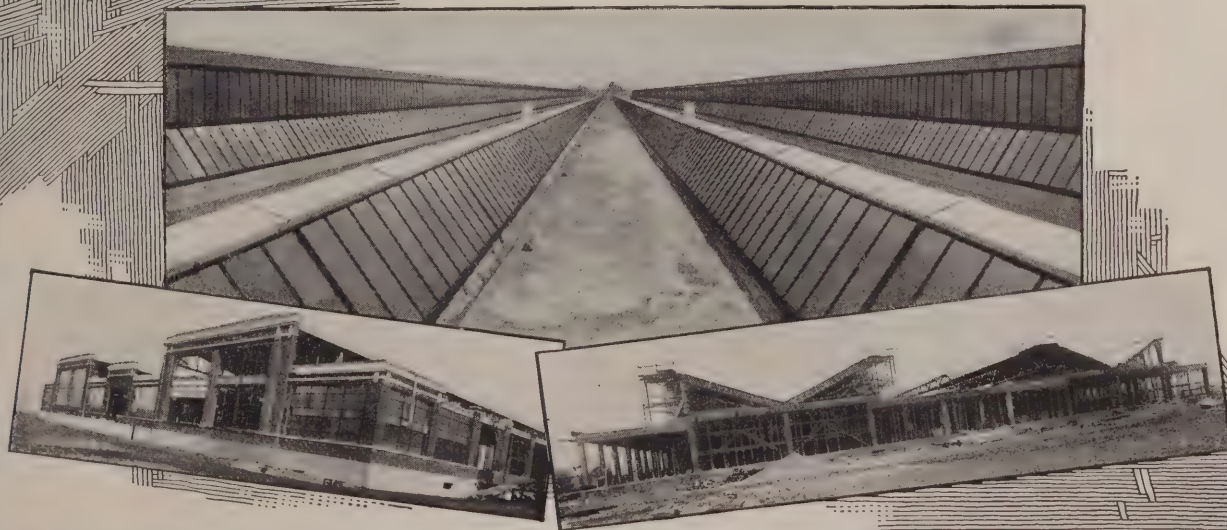
PHILADELPHIA, PA.

In effect, the roof is a series of Pond Trusses, alternating with Pond A-frames over low points between the trusses. The A-frames admit air; the inverted roof slopes of the Pond Trusses, leading directly to the outlets, insure complete discharge of stale air and prevent cross winds from blowing through. All heat-producing operations are located under the outlets.

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for factories  
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Domestic Engineering Co., Dayton, O. Schenck & Williams, Architects.  
Present section 270 ft. wide, 1000 ft. long. Pond Continuous Sash, top-hung and overlapping storm panels at the ends, used in all roof inlets and outlets, with Pond Operating Device, Motor Driven. Lupton Factory Sash in side walls.



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METAL  
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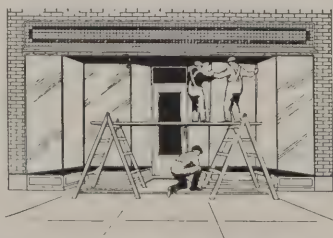
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*Power House, Charleston, South Carolina  
Architects, Harris & Richards, Philadelphia, Pa.*



# DAHLSTROM

## Hollow Metal Products

The close proximity of this power house at Charleston, S. C., to the water's edge, doubtless was one of the considerations which actuated the architects in specifying so high a quality product for a building of this character.

Inherent in Dahlstrom Products are those qualities and procedures of manufacture which anticipate service out-of-the-ordinary under variable climatic conditions or exposure to moisture.

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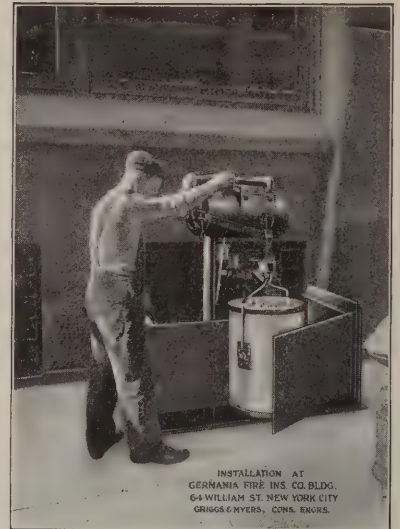
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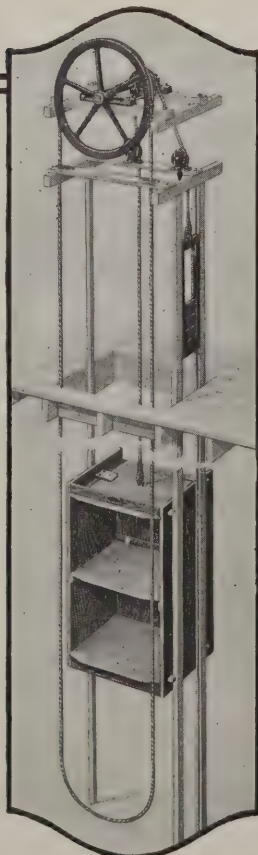
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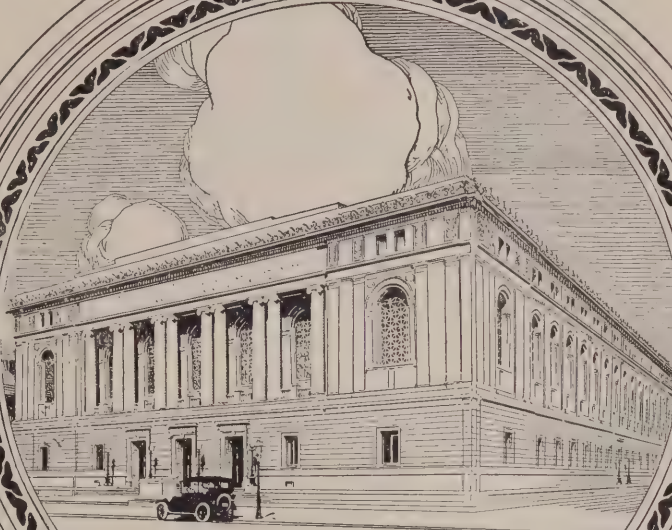
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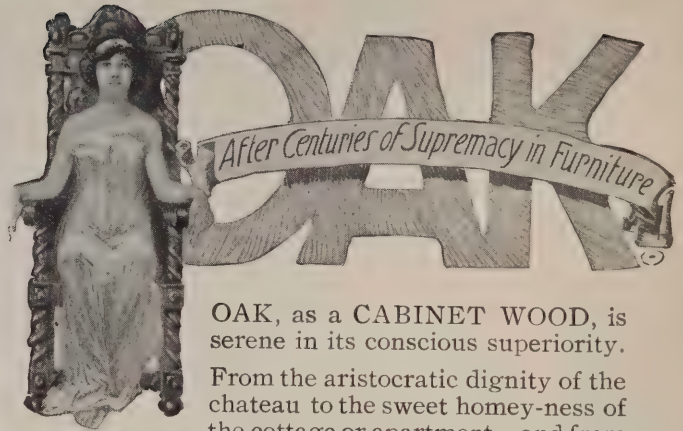
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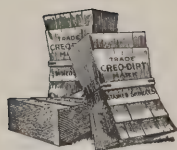
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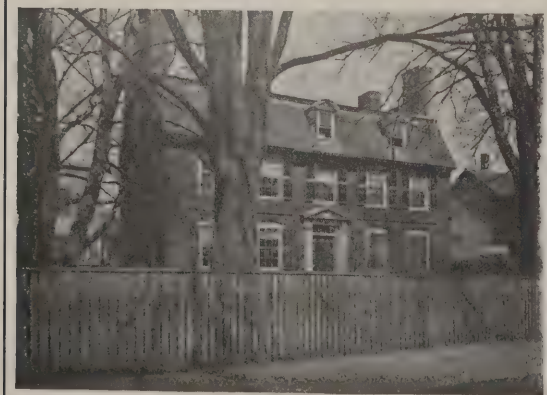
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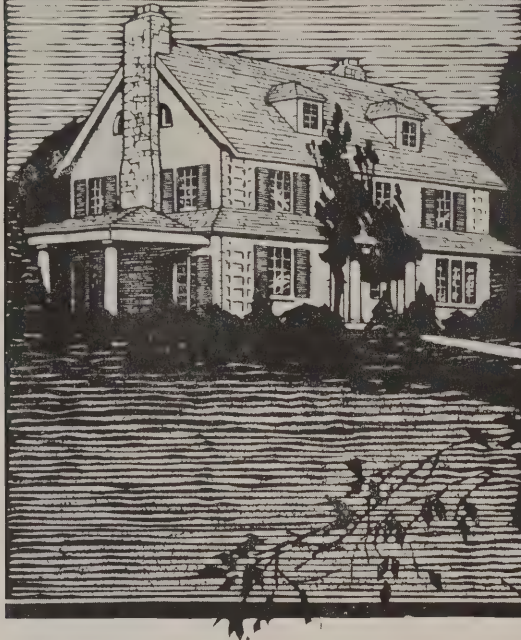
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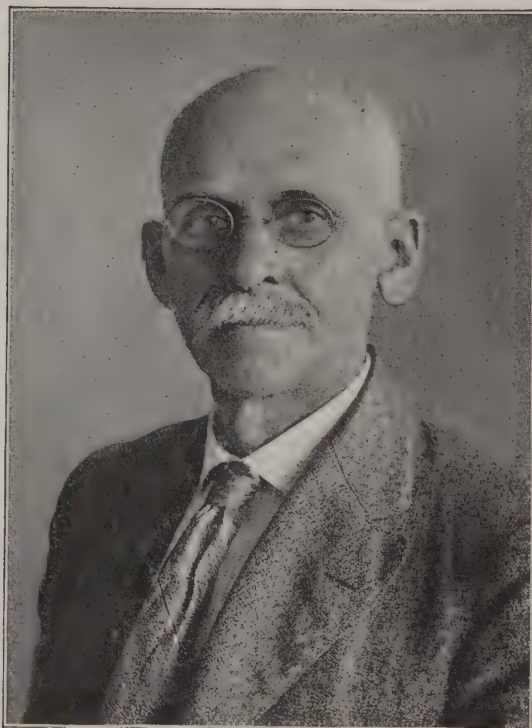
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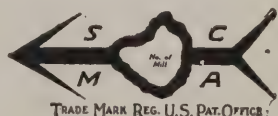
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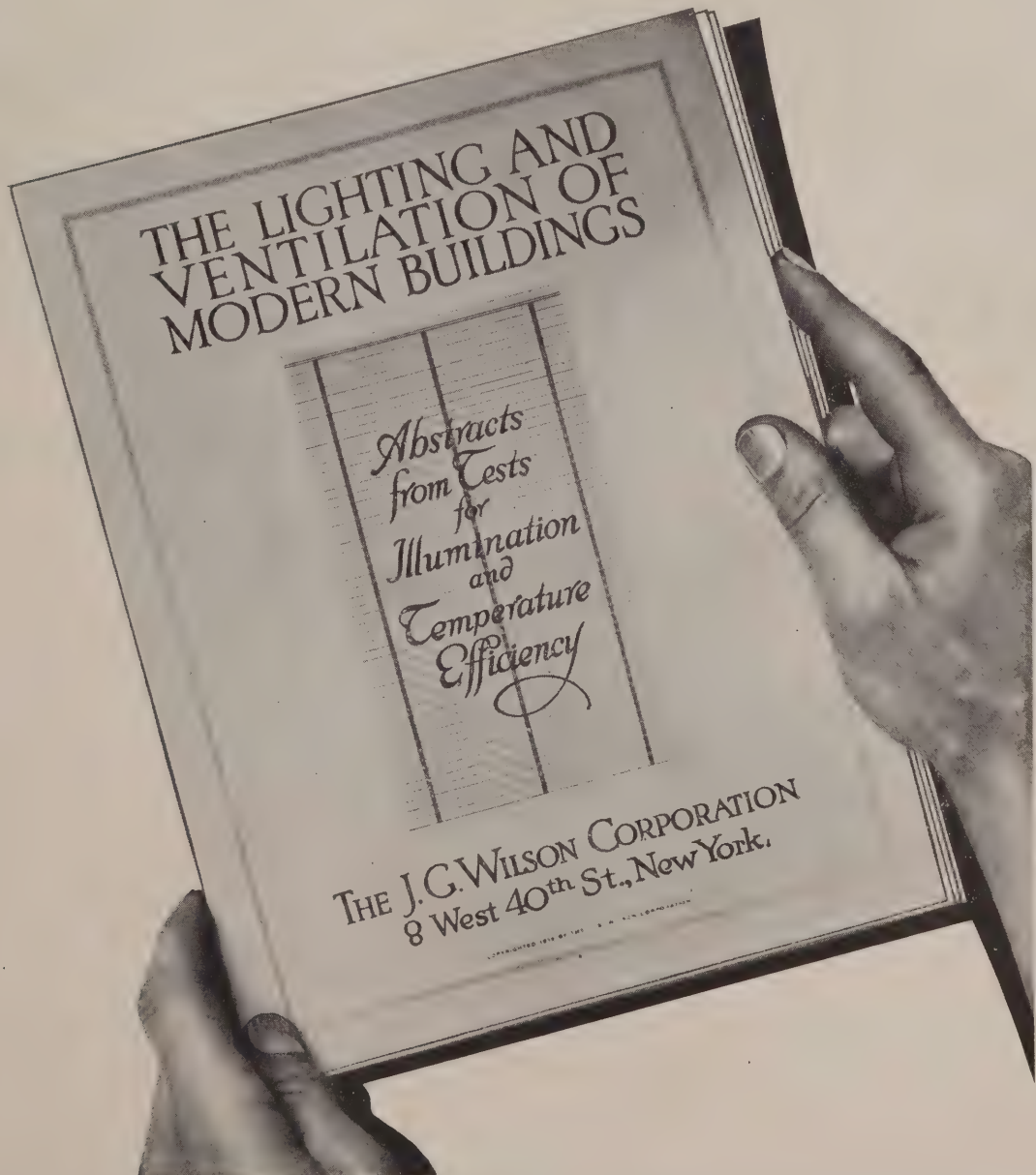
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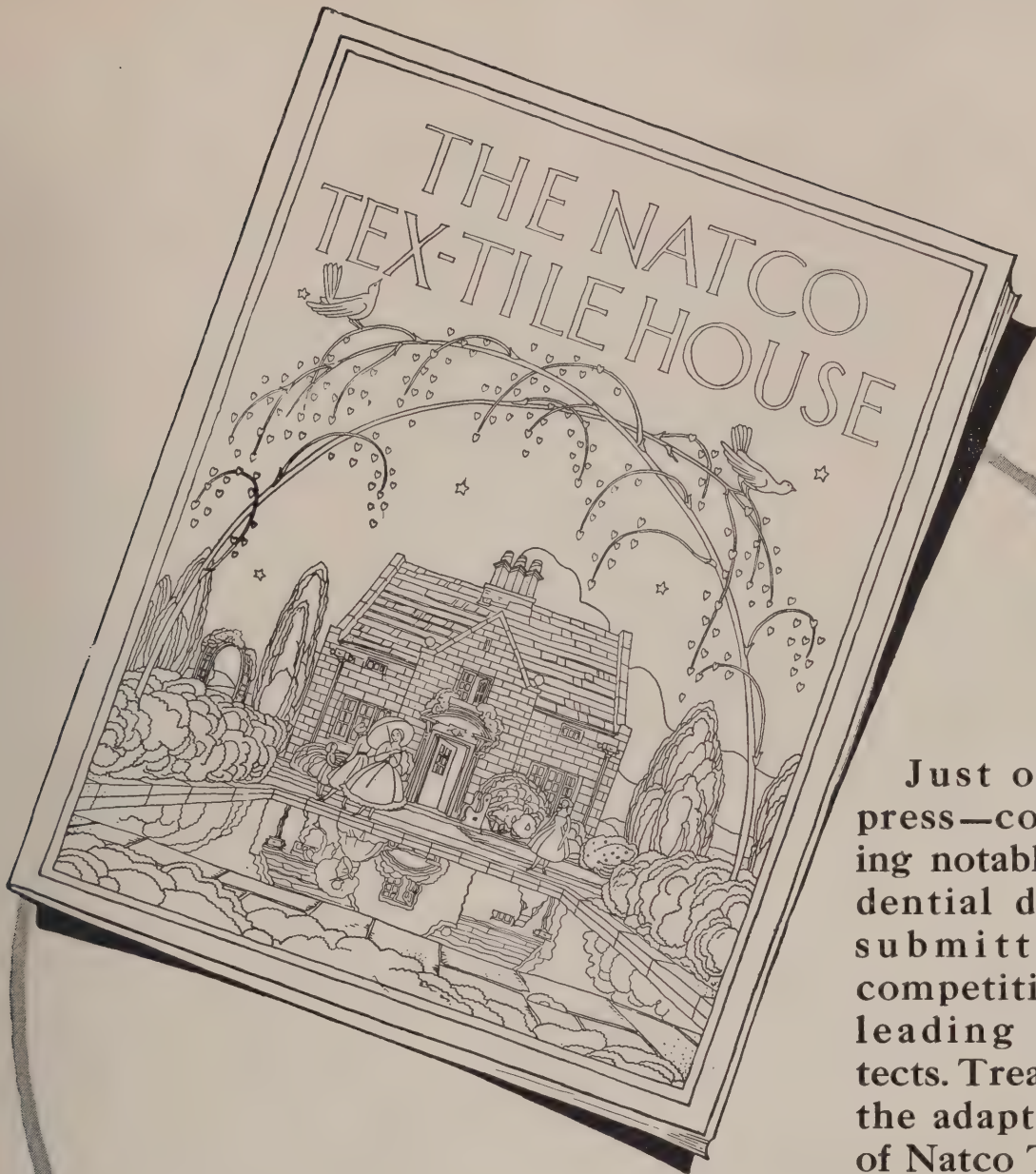
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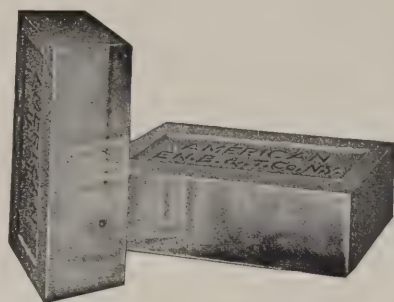
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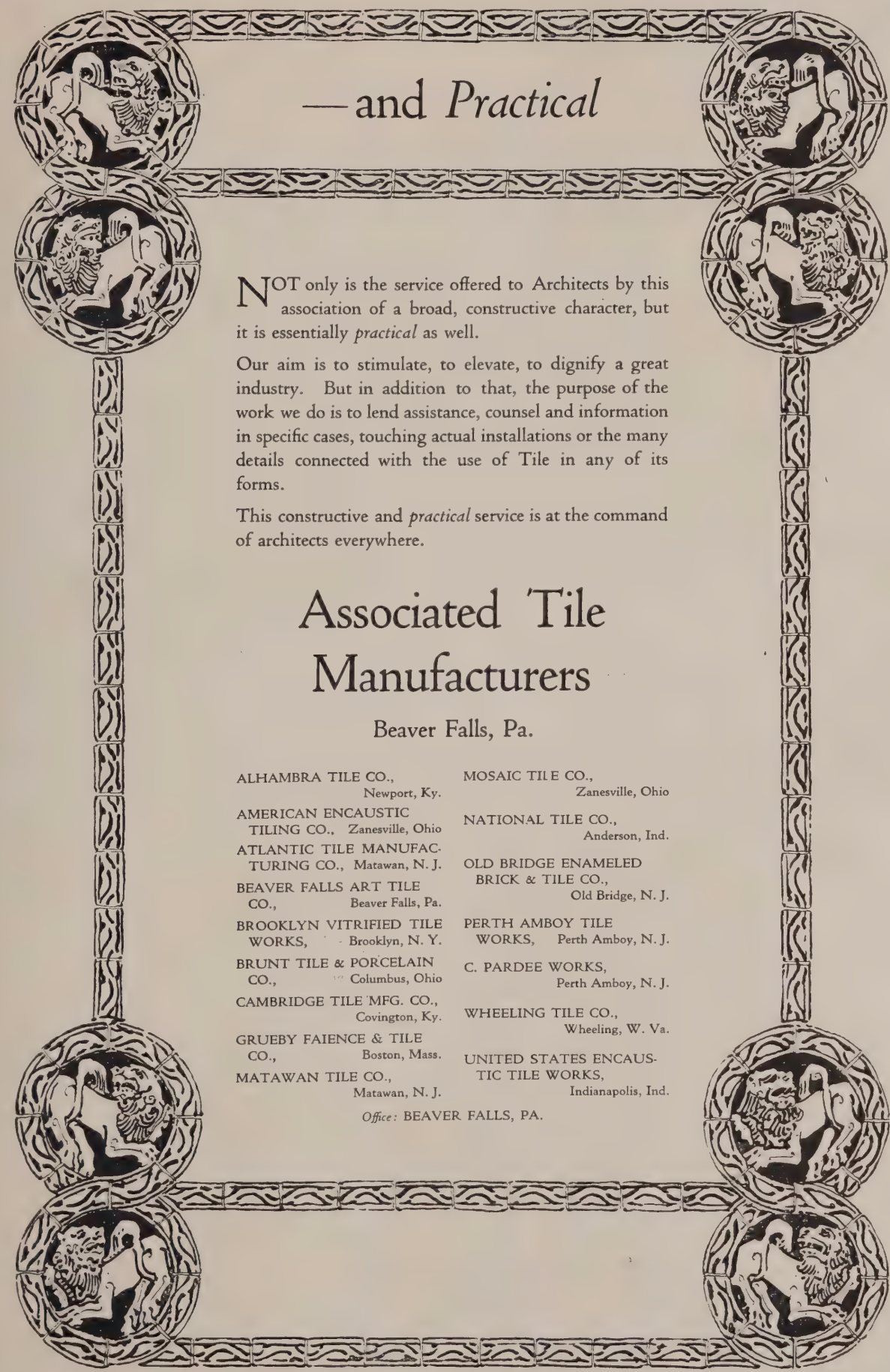
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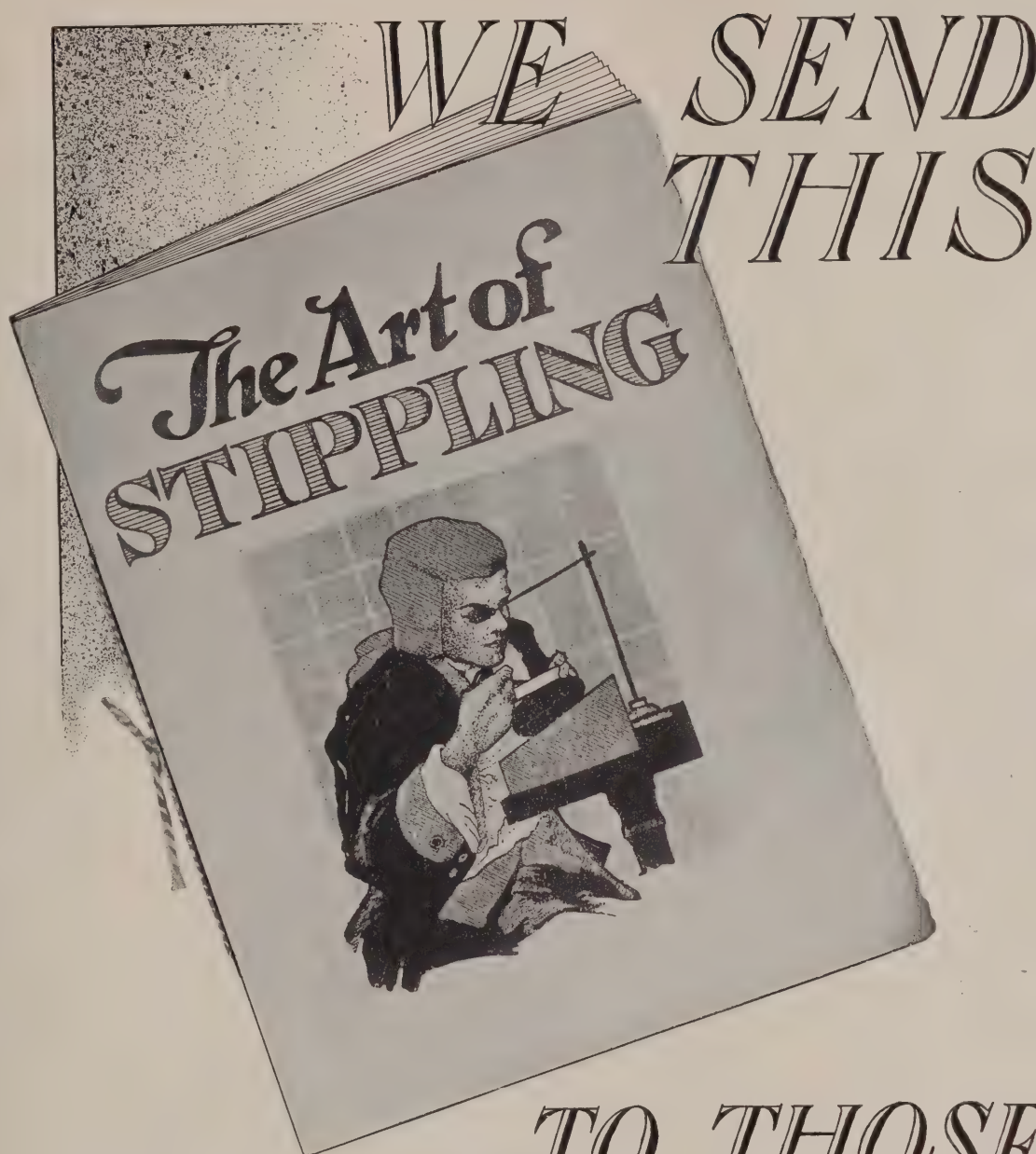
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# THE ARCHITECTURAL FORUM

VOLUME XXVII

NUMBER 3

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DAY & KLAUDER, ARCHITECTS



# THE ARCHITECTURAL FORUM

## FOR QUARTER CENTURY THE BRICKBUILDER.

VOLUME XXVII

SEPTEMBER 1917

NUMBER 3

### One-Story and Open-Air Schoolhouses in California

SECOND AND CONCLUDING PAPER

By WILLIAM C. HAYS

IN the previous article, published in July, 1917, the attempt was made to explain the simplest unit which, repeated in varying ways, goes to make up the one-story or open-air school *ensemble*. Something of the inner significance of this return to an age-old type was there illustrated by particular reference to one simple and charming example at Pasadena.

It remains to seek out some of the other phases of the problem, such as its physical and psychological aspects.

California comes honestly, as through inheritance, by this broad-spreading type of architecture in her schoolhouses, for the earliest schools in the state, those connected with the Missions, were held in rooms grouped about patios and under arcades. If primarily the Franciscan fathers built their structures only one story in height because the restricted material and labor did not permit them to do otherwise, they at least builded better than they knew to fit the peculiar conditions of the unknown country in which they found themselves. The type which their unskilled Indian helpers constructed naively, with "adobe" bricks, so suited the climate and, on the whole, so well met the quite unforeseen earthquake conditions that it was adopted without further experiment for most of the construction, institutional or domestic, during the days of the *padres* and the *rancheros*.

Years later, after the exploiting of California had suppressed all Spanish power and too much of the Spanish traditions, a half knowledge of architecture, and a rather sentimental revulsion toward a past with which the new conditions had very little in common, led to the demand for "Mission" architecture as the one and only appropriate "style" for public buildings and schoolhouses in particular. In the wake of the abominations launched then, there now seem to be following signs of a saner view—the view

which recognizes a polar difference between the essential, informing spirit of architecture and the meaningless copy of superficial detail. However, all too commonly is style—the transient quality—exalted above those qualities—the architectural fundamentals—which, being changeless, are at the rare creative moment called forth into vitally new expressions, as new problems arise.

In its beginnings the California type of one-story school building, whether large or small, is probably more directly a response to certain practical needs than to any clear-cut philosophy of educators. There is little doubt that mere considerations of safety in time of earthquake or panic, and simplicity of construction, have been more directly responsible for the first growth of the type than any other causes. While it is true that the districts of the state most subject to earthquakes are near San Francisco, and while it is equally true that perhaps the best examples of one-story schoolhouses have been thus far developed in the district about Los Angeles, nevertheless earthquakes are by no means unknown in the southern part of the state. Fires, however, with their attendant danger of panic, may occur anywhere. If one can eliminate all stairways, then a long step is taken in the direction of safety, for escape in times of danger is assured, and there is no chance for stumbling or consequent jamming of the exits; there are no inside corridors, with their inevitable turns and congestions, since one steps from the room directly out of doors. This one-story type, further, is ideal for the smaller children, who have no leg-stretching stairs to climb.

There results, of course, a lack of compactness which under some conditions is a defect in the scheme, although, all things considered, the amplifying of extent has more advantages than disadvantages. First cost of construction is somewhat more than that of a multi-storied building which provides the same accommodations, although the

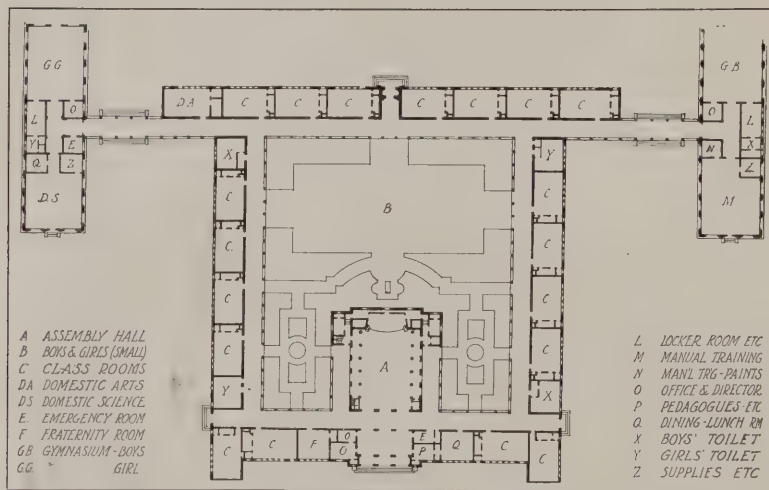
difference is less than it would appear at first glance. Greater length of foundations, but somewhat lighter; larger roof areas; longer runs of piping; wiring and other equipment—all these add to the cost. Largely to offset these additions in cost, however, it may be noted that the stairway space—a multiplied loss in the repeated stories of the high building—is all saved for class room area in the one-story building. As to upkeep and the matter of everyday care taking, there seems to be little difference in cost of efficiency between the two types.

From the viewpoint of administration there is no serious objection to the lack of compactness in the one-story building, at least, for the grade schools. In high schools, if the registration is very large, requiring the movement of crowding

pupils between classes, the scheme is not so practical, although this objection does not hold in the smaller high schools. With the younger children their natural restlessness makes it desirable that they should move about, so the long corridors serve an admirable purpose, for when bad weather comes these roofed spaces prove anew their great value, and used for play, give plenty of length for a romp. Unless the passageways are partly enclosed, air circulates so freely that there is no danger of treacherous drafts, and in California, except in a few localities, there is never a need for glazing or enclosing much of the corridor, even during the cold or rainy season.

Thus far we have considered factors which, pointing most favorably toward the one-story school building, are almost all of a practical, "hard-common-sense" character.

But deeper, if less tangible, forces have been at work in the minds of those who think much about school buildings. There has been much consideration given to the psychology of the problem. Longfellow, in his day, could write of "The Children's Hour"; but one fact to which people are reawaking is that we live in the day, the age, and not merely the hour of the child. To prepare children, by an enlightened fitness, for duties already far more complex than their parents will ever grasp, and which duties posterity must assume, is the first concern of

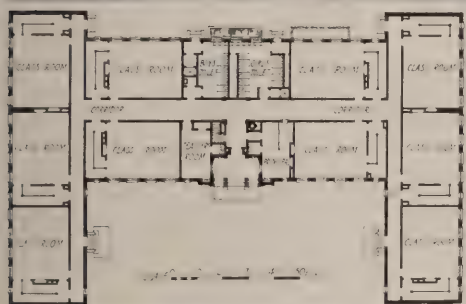


Ground Floor Plan of Lockwood School



Lockwood Elementary School, Oakland, Cal.  
John J. Donovan, Lewis P. Hobart, Associate Architects





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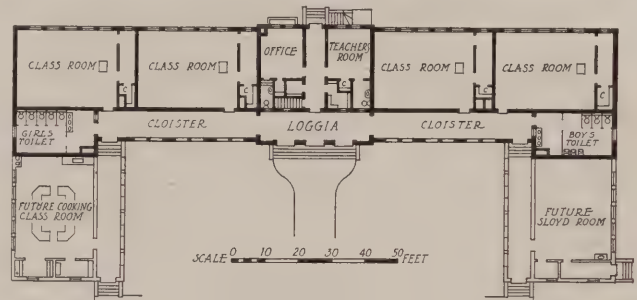
been change; we call their theories now "child-psychology" instead of the less concise "philosophy discussed by the ancients."

The opportunists, too, have much to say of the "spirit of the age," a pretty phrase, and misleading, for it is neither definite nor related to fixed time. Paul Shorey, indeed, quotes James Russell Lowell as saying, "I have seen too many 'spirits of the age' to be afraid of this one." But, whether old as time or new as to-day, high values lie latent in recognizing the intense and sensitive individuals, who mingling, are mankind. For this principle the World wars!

The school environment, then, which shall be a microcosm of life itself; which shall from the beginning accustom the child to "willing," to freedom of movement, to freedom of choice, and at the same time to a repeated experience of the unswerving results of such free choice; a practical, reiterated experience, until it becomes *d'habitude* in the association of action with reaction: this is the psychological basis of the new type of educational "plant." Surely, its special sort of curriculum must be taught in surroundings quite different from those connected by tradition with an old inexorable "rule of thumb" method. Something of this very different attitude has already been pointed out, none too clearly, in describing the Polytechnic Elementary School at Pasadena. The vital, guiding principle is the establishment as nearly as possible of a perfect *rappor*t between the child and his physical and intellectual environment — the attempted reaching of a pupil through the channel of his responsiveness. The term "unresponsive" is, after all, misleading if not false, and its use depends upon



Detail of Entrance Pavilion



Floor Plan, Fremont School, Alhambra, Cal.

whether or not the "response" is flattering. All sane people, young and old, are responsive; but it is the in-born attitude of all, particularly of children, to withdraw from the stranger. Shyness is the natural response to aloofness; friendliness to friendliness; ingeniousness in the presence of the accustomed. "Achieve such an environment and



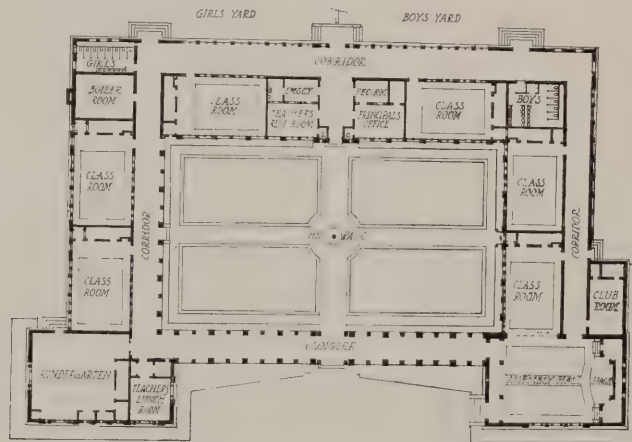
Fremont School, Alhambra, Cal.  
Allison & Allison, Architects

you will have prepared your child's mind as a fallow field," say the psychologists; and it may be inferred that the simpler forms of building, such as the one-story type, promise best results as forming the least strange environment.

To contribute to this effect, as well as for several other reasons, it is desirable that the "institutional" look be avoided in school buildings, even though they must, commonly, be larger structures than their neighbors. Where, in a given large city, the relatively few children of the "well to do" have their play provided for, and can be taken to parks or out into the country, it is necessary to make some other provision for the play time of the great majority. Where schools are best located, that is, centrally for the larger areas of child population, the average surrounding building is small in scale, although an exception is found in the congested tenement districts of the larger cities. In any case with the larger cities, it is only for the outlying districts that the one-story buildings can be seriously contemplated; but, admitting it as a practicable possibility, this one-story type is least removed in character from the many small unit groups of the neighborhood housing.

In or near such closely populated districts, then, the low irregularly rambling type of design is best—that type which, preserving any natural growth of trees and shrubbery around it, least sets the schoolhouse apart and, removing it but little from the atmosphere of the every day life, therefore best meets at least one of the psychologist's problems. Thus planned for and properly established on an adequate site, the school with its yard makes use of enough room to allow for some planting of trees as well as flowers. At almost negligible cost the school administration can assure an area in which some thought has been given to beauty as a neighborhood asset, and it can confidently be expected that such a lead will find a ready following.

Thus far little has been said of the school playground—not because of any lack in its importance, but because its problems are simpler, and, as to its desirability, there is no difference of opinion. Even in connection with the ordinary, many storied type of building, the playground is a vital part; with our type it is interwoven inseparably. The one-story scheme, necessarily spreading out over large areas of ground, assures ample breathing and sunshine



Floor Plan, Santa Fe Elementary School, Oakland, Cal.



Santa Fe Elementary School, Oakland, Cal.  
John J. Donovan, Architect



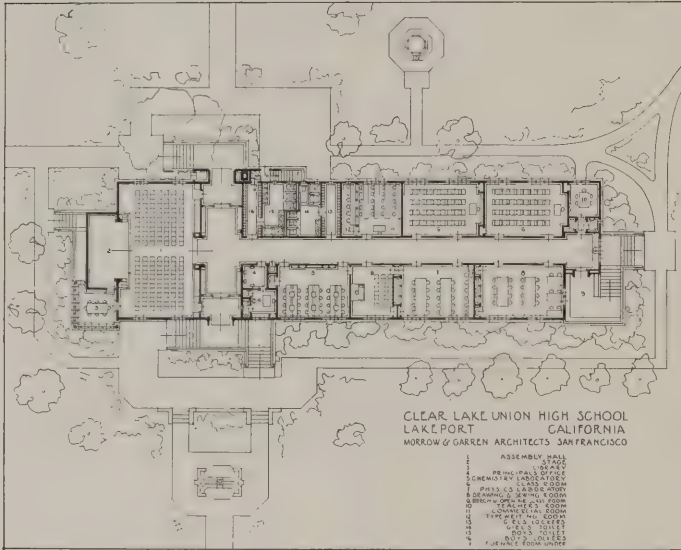


VIEW FROM REAR  
GRAMMAR SCHOOL, ARTESIA, CAL.  
WITHEY & DAVIS, ARCHITECTS





General View from Main Approach



Floor Plan, Clear Lake Union High School

spaces, even though taller buildings might in the future be built on all sides. Granting that the scheme is an impracticable one in congested districts where large land areas are not to be had, land in the growing California cities is still comparatively cheap and readily obtainable, because

the people in most of these communities realize the potential value in these play spaces for wholesome childhood. The public playground is thus naturally developed for use both during recesses and after school hours; and the older generation have a part in its activities, with the corresponding psychological values that associate school with play, and that are inherent in the substitution of a spirit of joy for that of drudgery, in the child mind.

Of this subject of one-story schoolhouses, one writes as if they were the rule, rather than the exception. Unfortunately, the reverse is true, so that one wonders, for the moment, why the good examples are not more plentiful. However, this condition of things is not so strange, after all. How few are the men and women who really think! And even among these they are few who have vision, and fewer still who dare venture, while the venturesome find followers seldom indeed. For how shall we distinguish between the "visionary" and the one with vision? "We cannot face things as they are, for we cannot see things as they are; but — as they appear," some one has written.

But those to whom is entrusted the responsibility of providing schoolhouses are not supernormal men and women, neither are the boards nor their architects. How uncommon, then, must be the coming together of a trained, sympathetic, and far-seeing architect and a school board that understand how to help, instead of hinder, in fully developing the possibilities of the



Clear Lake Union High School, Lakeport, Cal.  
Morrow & Garren, Architects



problem in hand! Not every architect with whom the authorities deal is fitted to design school-houses, for his must be an open and flexible mind, who may hope to appreciate the many viewpoints and to solve such an ever varying problem.

In reality, school buildings—more especially those “up-the-state”—are too commonly treated

as of negligible importance and are too seldom entrusted to capable designers. Conditions are slowly improving, of course, but the architectural profession has heretofore attached minor importance to this “country town” practice. It has been a legitimate field for the scrambling of mediocre men and the technically unfit, for whom there

seem to be assumed different standards of ethics, or no standards at all. When local school boards, meaning well, but having only half-knowledge, engage the proffered services of self-styled, sales-soliciting “specialists,” they are, too commonly, worse than wasting their opportunities. As there are, in business, “good trusts” and “bad trusts,” so of course there are capable and incapable “specialists,” but the better ones usually say little in regard to their special fitness for consideration.

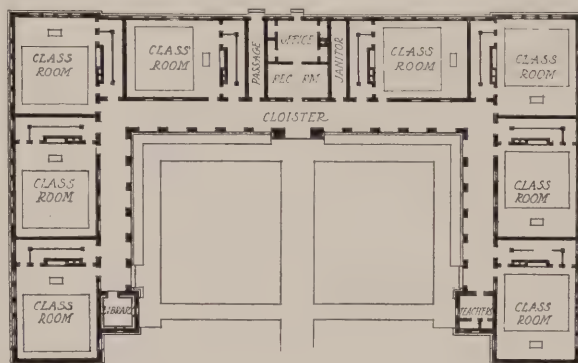
How shall boards learn wisely to seek *the man* (rather than to permit *a man* to seek them), the man, not too plausible and “cock sure,” who frankly says: “Together we must analyze our problem, and take what length of time it may need, until in finding the essentials of the problem we will have evolved a solution vitally new”? It

matters but little how many buildings of any type the “specialist,” if he chance to be of the wrong kind, may have built; for many of them may be failures. And the enthusiastic, trained man—with never a schoolhouse in his experience—may so master the problem and its intricacies as to produce the masterpiece.

There are many such

men, most of them relatively young with no claims to any “specialties,” to whom might confidently be entrusted important commissions for school buildings, and the results might be depended upon.

It is because of this too frequent failure to bring about the intelligent co-operation of officials and their architects in making a serious study of the problem that so comparatively few successful school equipments ever come into being.



Floor Plan, Grammar School, Santa Paula, Cal.



Grammar School, Santa Paula, Cal.  
Withey & Davis, Architects



## Woodridge Langley School, District of Columbia

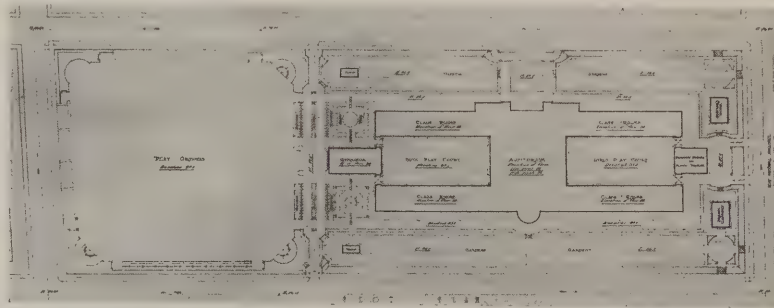
JAMES RUSH MARSHALL, ARCHITECT  
SNOWDEN ASHFORD, MUNICIPAL ARCHITECT; BEDFORD BROWN, ASSOCIATE

*IT is interesting to note that the one-story type of school building which is so admirably suited to conditions on the Pacific Coast has many features that commend it for use in the East, as evidenced by the Woodridge Langley School to be shortly constructed in the District of Columbia. Different climatic conditions necessitated some deviations from the California principle and further changes were required by the contemplated use of this building as a community center, but the large extent of the grounds and the completeness with which it is proposed to develop them, together with the material departures from the usual type of Eastern school plan, make the building of especial interest from both educational and architectural standpoints.*

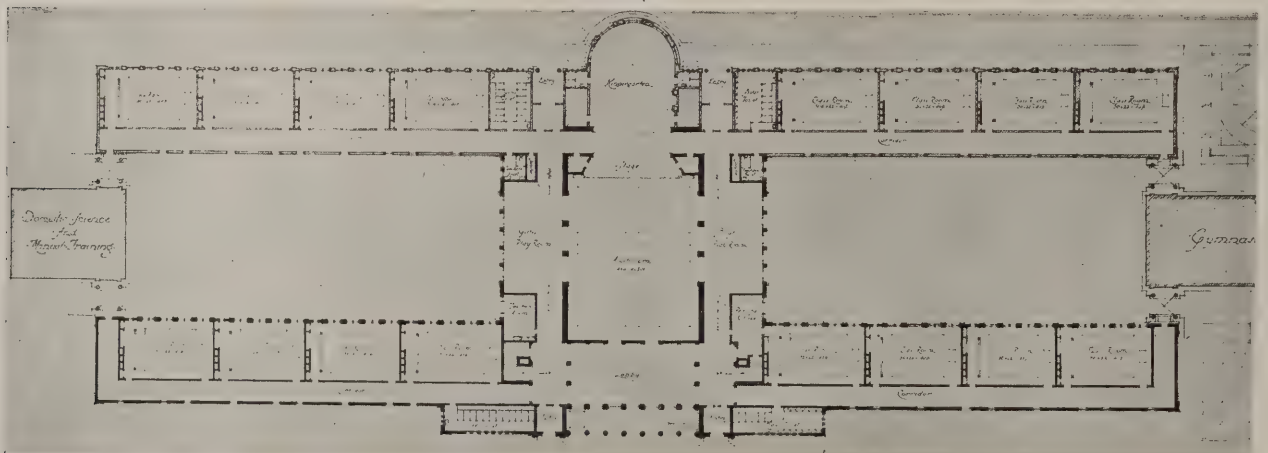
*The entire structure is of the one-story pavilion type*

*with exception of the central part containing the auditorium, which is two stories high to provide a balcony and two class rooms with north light. The kindergarten adjoins the stage and may be made a part of it when occasion demands. All of the class rooms are south lighted with projecting corridors on the north. They are 22 feet wide and graded in length from 28 to 32 feet. Coat rooms adjoin each, and are separated by a screen reaching to the top of the blackboard. Closets occupy the space not used for flues in the east walls.*

*Toilets are located in each of the four wings and principals' and teachers' rooms in central pavilion. The heating of the class rooms and auditorium will be from indirect radiation with individual fans and fresh and foul air ducts, and other portions from direct radiation.*



Plot Plan



Ground Floor Plan



Elevation of Rear



# The Motion Picture Theater

## IV. HEATING AND VENTILATING AND TYPE OF PLAN

*Fourth and Concluding Paper*

By CHARLES A. WHITTEMORE

TWO of the principal requirements of a motion picture theater are good heating facilities and adequate ventilation. A few years ago in theater construction they were dismissed as of slight importance and little or no attention was paid to the careful layout of the installation which its satisfactory working demands. In many instances it would have been far better to have eliminated some of the expense in decoration and display and put a little more money and thought into ventilating equipment.

The convenience of the patrons is so vitally affected by the conditions of the air and temperature that the majority of owners of motion picture theaters to-day are realizing the importance of these factors and are turning their attention to the proper heating and ventilating of their theaters. The more recently constructed motion picture houses show clearly the study of the subject and the attempts to increase the comfort of the patrons in this direction.

There are roughly two types of ventilating systems in general use: one in which the air is taken out at the floor and the other in which the air is taken out at the ceiling. The relative merits of these two types from a scientific standpoint need not be discussed in this particular article, but in order to illustrate clearly the difference between the two types, it may be well to call to mind a few of the factors pertaining to each.

Vitiated air, being warmer than the surrounding atmosphere, has a tendency to rise. Particles of dirt and other foreign matter in the air are heavier than the atmosphere and have a tendency to fall. The contentions of those who favor removing the air at the floor are that the fresh air brought in at the ceiling and exhausted at the floor allows a continual current of fresh air to pass by the patrons without allowing any of the vitiated air to rise.

Theoretically this may be true, but those who oppose this theory and uphold the other scheme—that is, taking the air out at the ceiling—maintain that in order to accomplish ventilation by this method, not only is a larger maintenance cost incurred, but also that theory and practice do not work together. Actual tests will demonstrate that vitiated air does rise to a certain extent, contrary

to the theory of those who uphold this type, even though the ventilation currents are working in the opposite direction.

There are also practical difficulties in the way of operating this scheme to advantage, in that it is necessary to pull the air down to the lower levels and then have the discharge fan, which is usually located at an upper level, pull the air up again. Those who favor the other type ask why it is not advisable to allow the natural upward tendency of the heated air to assist the ventilating apparatus in accomplishing its work. They also maintain that by introducing fresh air near or at the floor level the ventilation is more effectively accomplished and the vitiated air is carried off at once without any possibility of the patrons re-breathing it. This type of layout is as simple as the first type, and the maintenance cost per cubic foot of air exhausted is no more and possibly less than in the one first described.

The actual tests of the types above noted should be the criterion by which any installation should be accepted and, when one considers that possibly 1 per cent of the theaters in the country are equipped with the ventilation system of the first type as against 99 per cent of the second type, the balance seems to be in favor of the second type.

In some places the law requires the first type to be installed, but the reasons for doing so are not clear and such an installation, as a rule, requires the services of special heating units in conjunction with the ventilation plant. For example, radiators are required in the outside walls and are all equipped with a fresh air box leading through the wall to the outer air and are called direct-indirects. The air comes in through the box, close to the floor, and is warmed by passing over the heating surface, discharging at the top of the radiator through a grille just below the breathing plane. This constitutes the only fresh air supply in this type of construction. It is possible to arrange the dampers in the air inlet in such a manner that the air can enter directly into the auditorium without passing through the radiator. This affords an opportunity to temper the air when the heating system is in use and is of great value in warm weather as an aid to ventilation.

The vitiated air passes from the auditorium

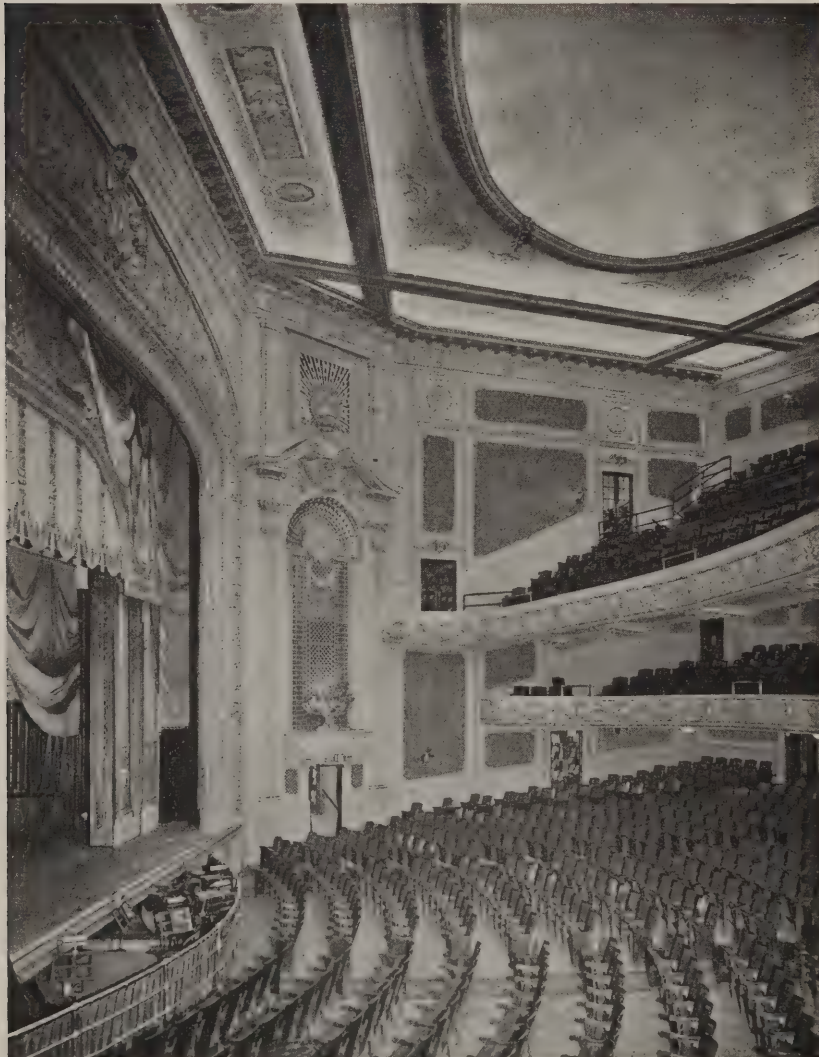
through registers placed at the floor level, usually at the base of a vertical duct, at the top of which is an exhaust fan of the propeller or multi-vane type. This system depends entirely on the exhaust fan for its working, as natural ventilation by perflation is impossible. This scheme also does not contemplate anything in the nature of plenum chambers where the air is forced into the room, nor does it permit the installation of individual ventilation for the seats or sections of seats.

Under the arrangement noted above it is exceptionally difficult at times to ventilate properly the space at the rear of the orchestra directly below the balcony, and at any time this section of the house presents the most difficult ventilating problem.

Since the first type is so simple in comparison with the second, a detailed study of the latter

method will be of more value. In this arrangement the fresh air is taken in as much above the ground level as possible so as to be free from the dust and dirt in the air. It is brought through ducts to a fan which in turn discharges into a large chamber called the plenum chamber, or into a system of ducts leading directly to registers or grilles located in such a manner as to distribute the fresh air evenly through the various parts of the house. A similar system of ducts is arranged on the ceiling under the balconies and galleries and sometimes in the main ceiling, these ducts all extending to one central point, at which place the exhaust fan is located.

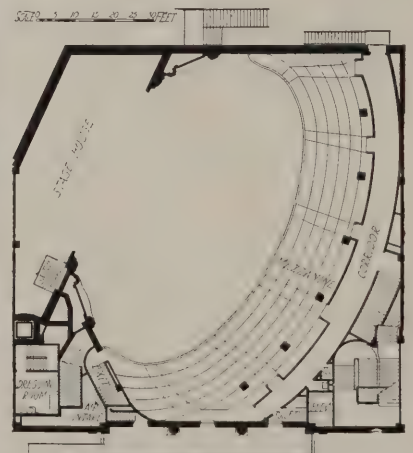
This is the essential part of the ventilation system and to its construction can be added various refinements in the nature of washers, tempering coils, aspirators, etc., as the conditions will allow.



Interior of Auditorium

#### RIALTO THEATER, CHICAGO

*The seating capacity of 1,500 people is unusually large for the size of the lot occupied—98 by 100 feet. Full advantage of the area was obtained by placing the auditorium diagonally within the square. A small mezzanine balcony where smoking is permitted is a feature of the interior. The space usually occupied by boxes is designed for the air supply and the organ. The interior work is of the Adam period in two tones of travertine color, with inlays of turquoise blue and gold. The walls are paneled with red and gold brocade. The lighting is by indirect reflectors, concealed in coves. The exterior is of old ivory terra cotta with columns of dark green terra cotta and gold caps and bases. The marquee is utilized as a fire escape balcony. Three green bronze doors open on to it from the center of Greek grille work done in dull green terra cotta, behind which a remarkable effect of glass has been obtained by the use of deep purple terra cotta.*



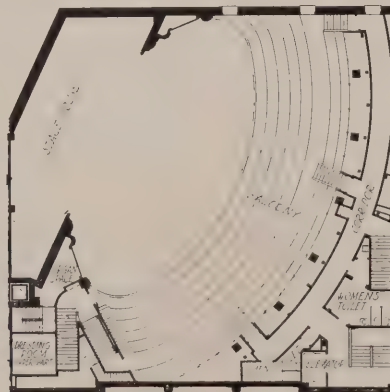
Mezzanine Floor Plan

RIALTO THEATER, CHICAGO, ILL.  
MARSHALL & FOX, ARCHITECTS

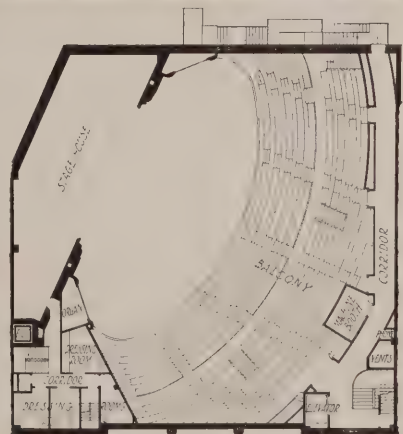




Auditorium Floor Plan



Lower Part of Balcony Plan



Upper Part of Balcony Plan

RIALTO THEATER, CHICAGO, ILL.  
MARSHALL & FOX, ARCHITECTS



The duct work between the fresh air inlet and the fan should be arranged in such a way as to permit of re-circulation of the air. In cold weather, when the thermometer may be down nearly to zero, the amount of coal required to heat the outside air to the desired temperature for the auditorium is a large item, and in order to effect a saving on this coal consumption the air in the auditorium is exhausted into the fresh air chamber by the same fan which forced it in through the plenum chamber.

This is the re-circulation principle, as the same air is used repeatedly but is mixed with fresh air and subjected to other processes to remove impurities. This is accomplished by some form of filtering device or apparatus specially designed to remove the dust and dirt and render the air fit for breathing again.

There are various types of construction designed for the purpose of removing dust and dirt and these types are constantly undergoing changes. The first type used to any great extent was the cloth screen. This was constructed with a strong frame the full size of the inlet opening, and cheese cloth or similar material tightly stretched upon it was used as a filtering medium. The air passing through this cloth was found to give up a large percentage of the dust and solid impurities and be much more hygienic and suitable for breathing. The percentage of impurities removed was not sufficiently large, however, so other methods were studied.

The next step was to arrange a fine spray which would keep this cloth moist and in this way it was found that the air was not only better cleansed but also cooled. This showed the possibility of devising a mechanical means of cleansing the air and lowering the temperature at the same time and led to the development of the air washer.

The disadvantage of the screen type of filter is, however, that the pores in the cloth very soon fill up with the more solid particles. The screen then forms too great an obstruction to the free passage of the air. To overcome this difficulty it is necessary to remove the cloth at frequent intervals, and substitute clean cloth, thus requiring a double set of filters.

Another type which has been extensively used is of a similar nature but different in detail. In this type the filtering medium is cloth, but arranged in the form of bags so that the air from either the fresh air chamber or the re-circulation duct passes through a metal plate which is pierced with openings about 12 inches in diameter, and at each opening is a cloth bag. These bags are

sometimes arranged, as noted in connection with the cloth screens, with a spray to keep the cloth moist. The advantage of the bag over the flat screen is that the heavier particles of air settle to the bottom of the bag without obstructing the openings for the air to pass through. In this installation also, however, it is necessary at intervals to change and cleanse the filter bags.

In more recent years an air washing device has been invented which serves the purpose of not only cleansing the air, but also of reducing or increasing the humidity and tempering the air to the proper degree in cold weather and also cooling it in summer.

This device consists in its elemental form of a large rectangular metal case in which is first placed the primary heating radiators or coils. These are for the purpose of raising the temperature in extreme cold weather to a predetermined point, under which conditions the air is more readily suited for the cleansing and cooling process. The air passes through these tempering coils and then is conducted through a duct to the spray chamber. This chamber contains a large tank in which water is kept at a constant level by means of a float or automatic device of some other sort, and the water from the tank is conducted through a pump to the pipes, to which are attached the spray heads. The spray heads are so regulated that the water under pressure going out through them forms a very fine mist and the particles of water, coming in contact with the particles of dust and dirt in the air, carry most of the impurities down into the tank so that the air after passing through this spray is probably 90 per cent clean.

After this operation the air furthermore encounters a series of eliminator plates which are designed in such a manner that the air must pursue a tortuous course, continually striking against projecting edges which have a tendency to extract excess moisture and also take out any remaining particles of dirt. The air then passes through a secondary heater where it may be raised to any desired temperature for warming purposes.

From this latter chamber it is conducted by ducts either to the plenum chamber or to the fresh air duct system. In either case the effect is relatively the same to the audience except that the plenum chamber permits of more general distribution of air through the house than is possible with the duct system.

In the air washer, if the temperature outside is particularly high as in summer and the humidity is very great, the spray need not be operated and only a small amount of water used on the elimina-



tor plates in order to keep them clean. The air then passing through these plates is cooled and at the same time gives up a percentage of any excess humidity.

Sometimes, also, the primary heater may be used in order to raise the temperature of the outer air and drive off some of the humidity before the air is washed. It is not advisable generally to use the heater in warm weather, however, as it necessitates lowering the air from a point above the prevailing temperature of the outer atmosphere.

The cooling process by means of the air washer is effective except in extreme cases, in which some other means must be employed to reduce the temperature further, and it has been found by tests that ice placed in the water tank will cool the water to such a point as to materially assist in bringing the temperature to the desired degree. This, however, is very expensive, as a ton of ice, for example, will lower the temperature of 22,000 cubic feet of air for a relatively short time only, and such an arrangement would accordingly be of value only for installations in such buildings as banks, where the demand is for a short interval of time during the middle of the day. In a motion picture theater it is more advisable to adopt some other expedient. For this purpose a small refrigerating machine with a brine circulation has been found most satisfactory.

In this latter method of construction the refrigerating machine operates in the same manner as when artificial ice is made and the brine circulation pipes are carried through the water tank, cooling the water to a given temperature, as 46 degrees for instance, which in turn passes through the spray heads and has a decided cooling effect on the air.

As an assistance in cooling the air the water for the air washer is frequently pumped from an artesian well, the temperature of which is always lower than city water. By this method refrigeration or other cooling device is not needed except under the most extreme conditions, provided the artesian well water may be pumped at about 50 to 55 degrees.

In introducing air into the auditorium and its various divisions, there are three general types of construction. First, registers or grilles; second,

mushrooms; and third, ventilators which are incorporated in the chair construction.

The first of these types is, as the name implies, an installation of registers in connection with the duct system. These registers usually have dampers, so that the air may be regulated in its flow and different volumes and velocities established as desired at any opening. The disadvantage of this type, as has been noted, is in its lack of flexibility and in the fact that the distribution of fresh air is not nearly so general as that provided by either of the other two types.

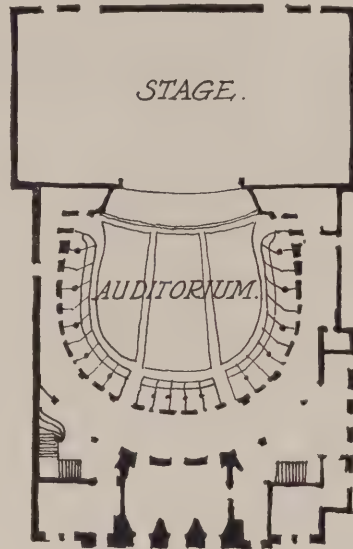


Fig. 1

The second type consists of the installation of plenum chambers or large air areas, under pressure from the fan, with the openings from these various plenum chambers through the floor of the orchestra or other divisions of the house protected by what are called "mushrooms." These are ventilation devices of cast iron which are adjustable so that the air may be regulated, insuring equal distribution in volume and velocity throughout the entire auditorium. They are particularly good in efficient general distribution of fresh air.

The third type consists of openings cut through the floor at the aisles and at intermediate points

where the seat standards occur. These seat supports are equipped with a special kind of register or grille, through which the air is brought directly into the auditorium. They are adjustable, so as to regulate the air flow in the same general manner as described for the other types.

The exhaust system is a reverse of the simple supply system and consists merely of various ducts carried to different portions of the house, which exhaust the air through registers or grilles at these points by means of a large fan which may be placed on the roof or other convenient location.

In connection with the exhaust system it is wise to consider the location of the exhaust registers so that the air may not be turned in the direction opposite to that of the sound waves. Otherwise, the patrons might find difficulty in hearing the words and music from the stage in the case of vaudeville or other performances.

In addition to the various subjects which have previously been discussed in connection with motion picture theaters, acoustics play an important part, but, unfortunately as yet the theory of

acoustics as applied to theaters has not been reduced to such terms as to make a fixed, inviolable rule of any particular value. The result is that each theater, being of special shape and size, requires individual treatment, making it necessary to study each problem by itself.

*Types of Plan.* All theaters may be divided into three general classes according to the type of plan, and while there are numerous variations from these standard types, reduced to the lowest terms, any theater may be classified in one of the three divisions.

The first type, Fig. 1, has a square auditorium in which the horseshoe type of seating plan is easily applicable.

The second type, Fig. 2, is a rectangular plan which immediately restricts the seating arrangement to one particular form.

The third type, Fig. 3, is also a rectangular plan with entrance on a long side in which a modification of the horseshoe type or the seating arrangement in Fig. 2 may be adopted.

The horseshoe type of plan as shown in Fig. 1 is not particularly applicable to motion picture theaters, although in many theaters existing to-day this seating arrangement may be encountered. It is difficult with this type to secure proper sight lines; the seats at the extreme sides of the house receive such a distorted view of the picture on the screen that they are practically useless. This type of plan is of special interest to those who have studied the foreign opera houses and the older theaters in the United States, as it was a type always adopted where possible, and it served its purpose well, for those theaters were devoted only to opera or drama—the motion picture being a recent development.

The second type, Fig. 2, is the one most frequently found in the motion picture theater world and is the one best suited to motion pictures as a general rule. The depth, however, may be so excessive as to render vision and audibility rather difficult; but given a house of this type of reasonable proportions the results secured are almost certain to be satisfactory.

In Fig. 3 the seating may be arranged as shown or in the same manner as Fig. 1, in which case the same objection is noticeable as in the first type, that is, the extreme side seats are of little value.

In the commercial development of real estate to-day the theater plays an important part. No other type of building is so applicable to the development of "back land." No other type of building is so little dependent on street frontage. Few other types of building construction can be better adapted to irregularly shaped lots.

Fig. 1 shows a theater with a large street frontage and for opera or drama can be used to advantage. It does not show the possibility of developing the inexpensive "back land" so clearly as does Fig. 2 or Fig. 3. In these types the lobby and entrance foyer may obviously be arranged so as to enter the auditorium at almost any point. Two such arrangements are illustrated.

By adaptations of these types almost any lot of land may be developed to advantage for a motion picture theater. Types are changing, constructional methods are changing, and theater managers are changing their ideas as to the wishes of the public. It is reasonably safe to prophesy that the theater in the next few years will develop into a building quite different from that with which we are familiar to-day.

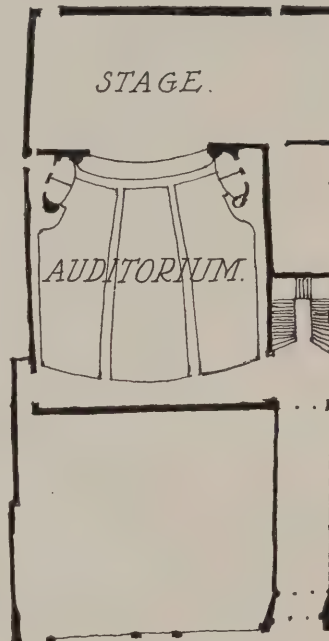


Fig. 2

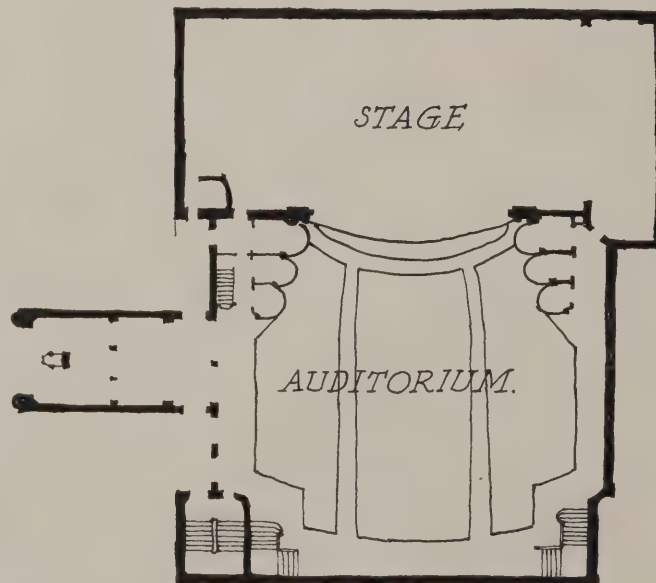
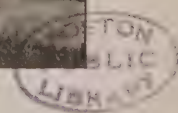


Fig. 3





VIEW OF BAKER COURT FROM WEST  
DORMITORY GROUP, CORNELL UNIVERSITY, ITHACA, N. Y.  
DAY & KLAUDER, ARCHITECTS









VIEW OF BAKER COURT FROM MIDDLE TERRACE SHOWING NORTH WING  
DORMITORY GROUP, CORNELL UNIVERSITY, ITHACA, N. Y.

DAY & KLAUDER, ARCHITECTS

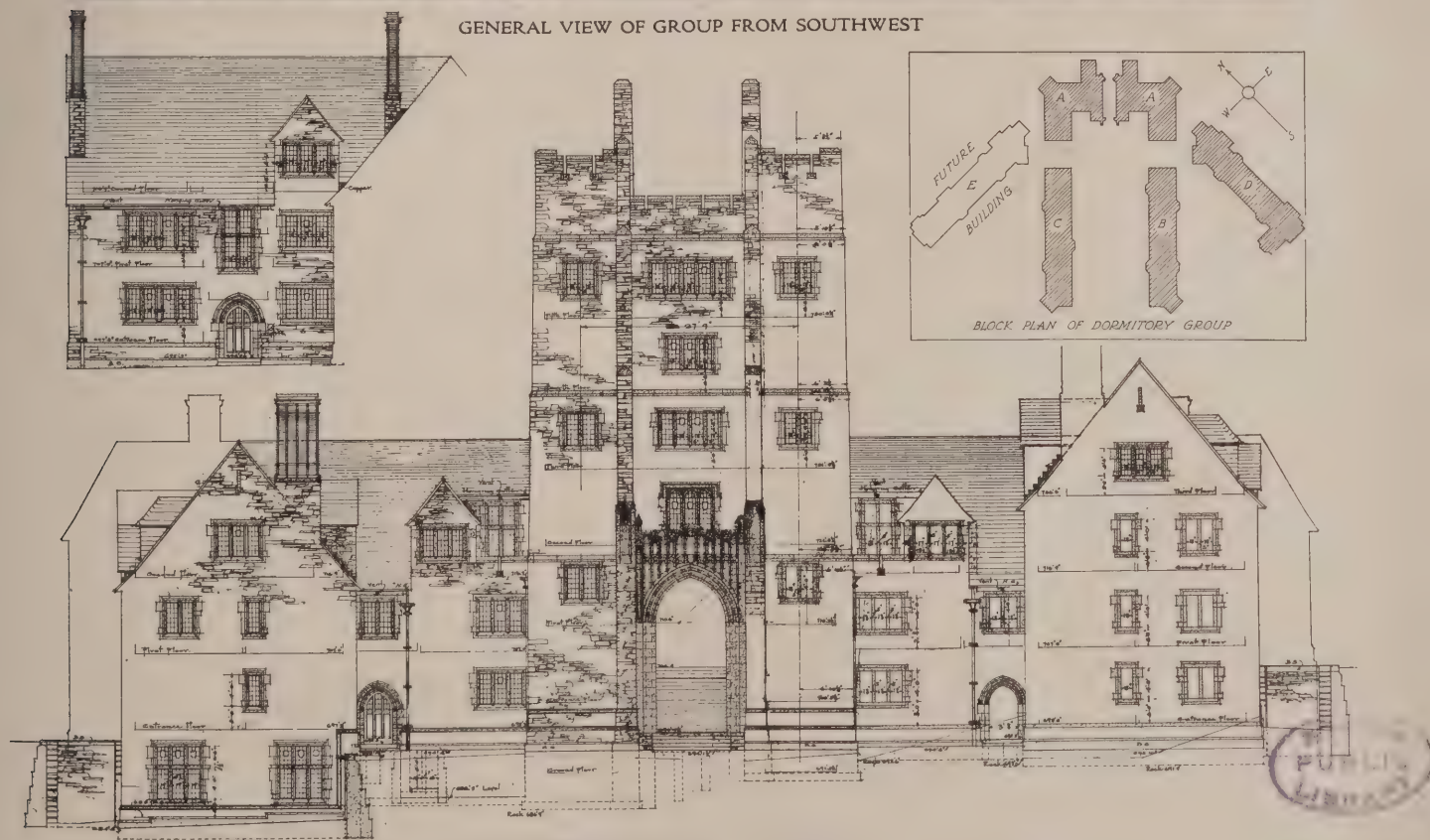








GENERAL VIEW OF GROUP FROM SOUTHWEST



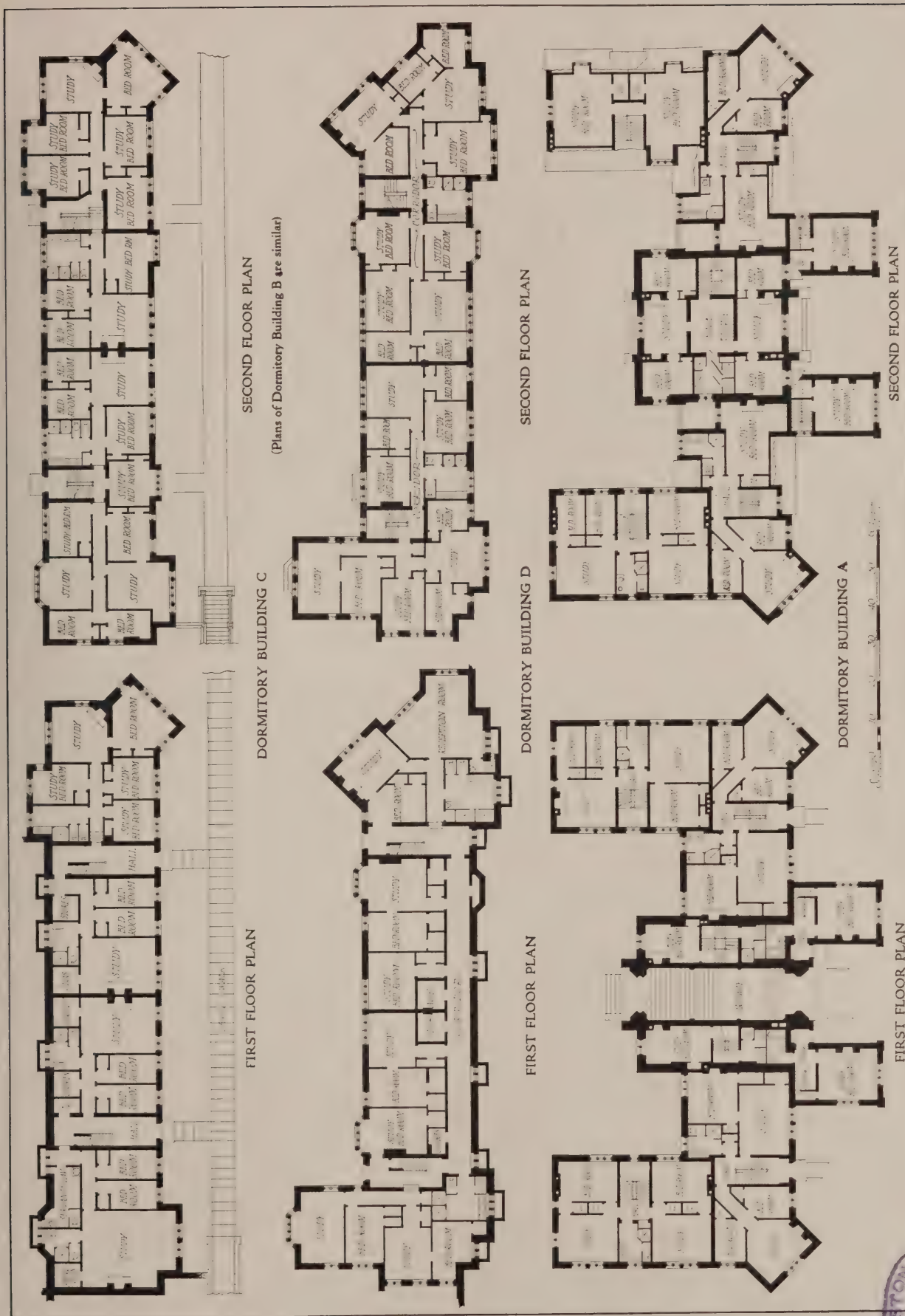
SOUTHWEST ELEVATION OF BAKER HALL

DORMITORY GROUP, CORNELL UNIVERSITY, ITHACA, N. Y.

DAY &amp; KLAUDER, ARCHITECTS

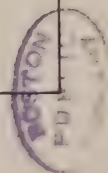






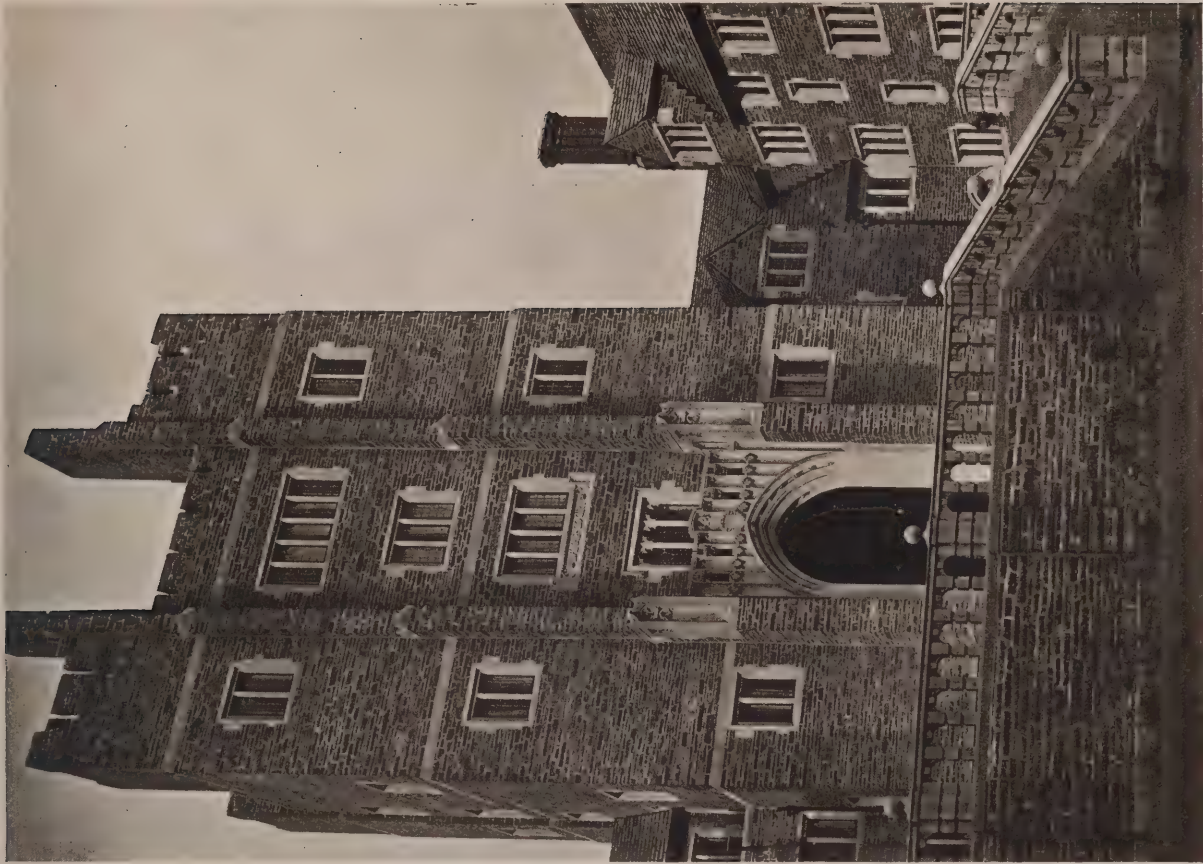
DORMITORY GROUP, CORNELL UNIVERSITY, ITHACA, N. Y.

DAY & KLAUDER, ARCHITECTS





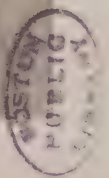




BAKER TOWER FROM SOUTHWEST  
DORMITORY GROUP, CORNELL UNIVERSITY, ITHACA, N. Y.  
DAY & KLAUDER, ARCHITECTS



BAKER TOWER FROM NORTHEAST





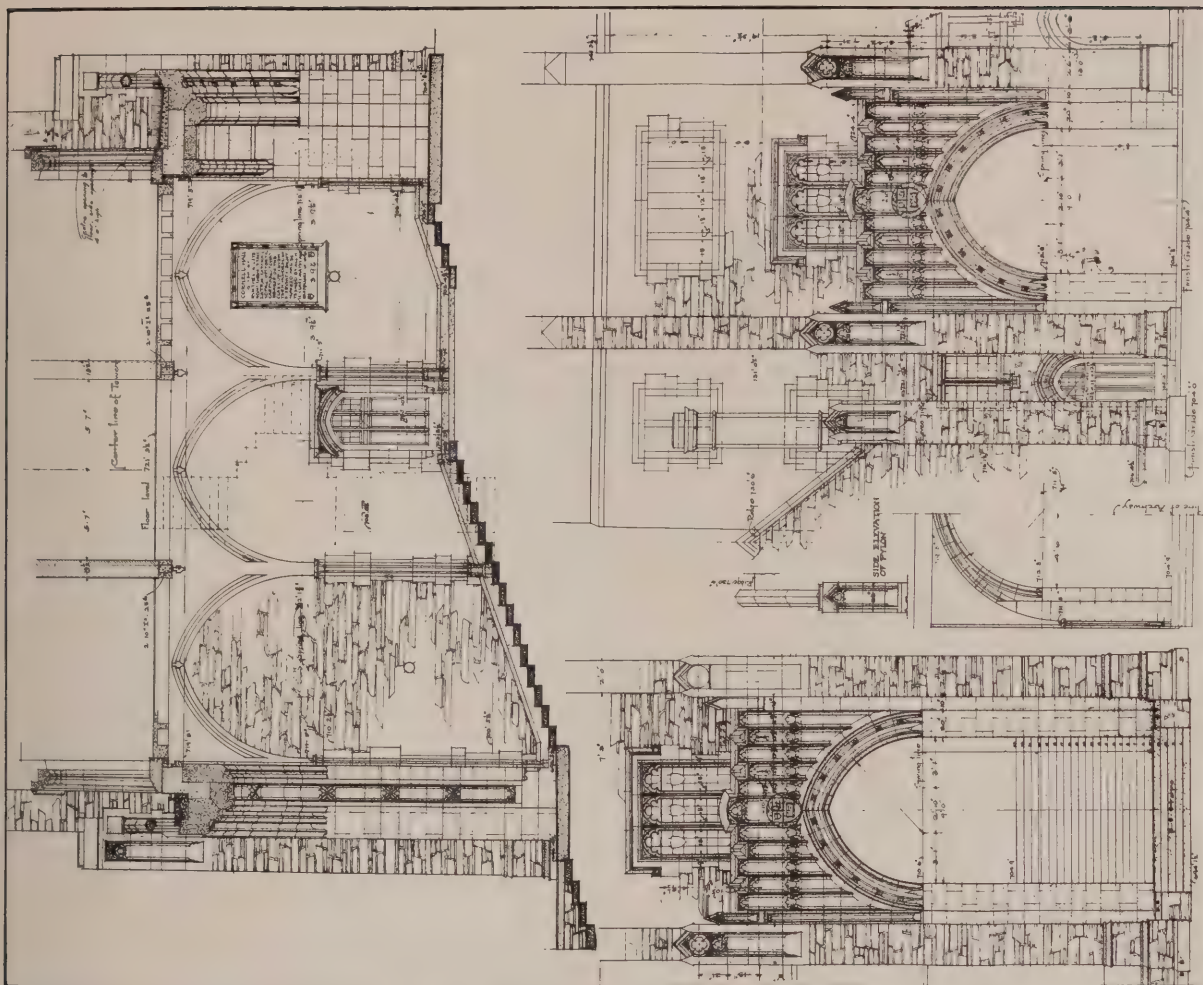




STREET ENTRANCE TO GROUP THROUGH BAKER TOWER  
DORMITORY GROUP, CORNELL UNIVERSITY, ITHACA, N. Y.  
DAY & KLAUDER, ARCHITECTS







DETAILS OF LOWER PART OF BAKER TOWER  
DORMITORY GROUP, CORNELL UNIVERSITY, ITHACA, N. Y.  
DAY & KLAUDER, ARCHITECTS



DETAIL OF COURT ENTRANCE TO BAKER TOWER  
DORMITORY GROUP, CORNELL UNIVERSITY, ITHACA, N. Y.









GENERAL VIEW ACROSS LAKE

BIRD HOUSE FOR THE ZOOLOGICAL SOCIETY OF PHILADELPHIA, PHILADELPHIA, PA.

MELLOR, MEIGS & HOWE, ARCHITECTS







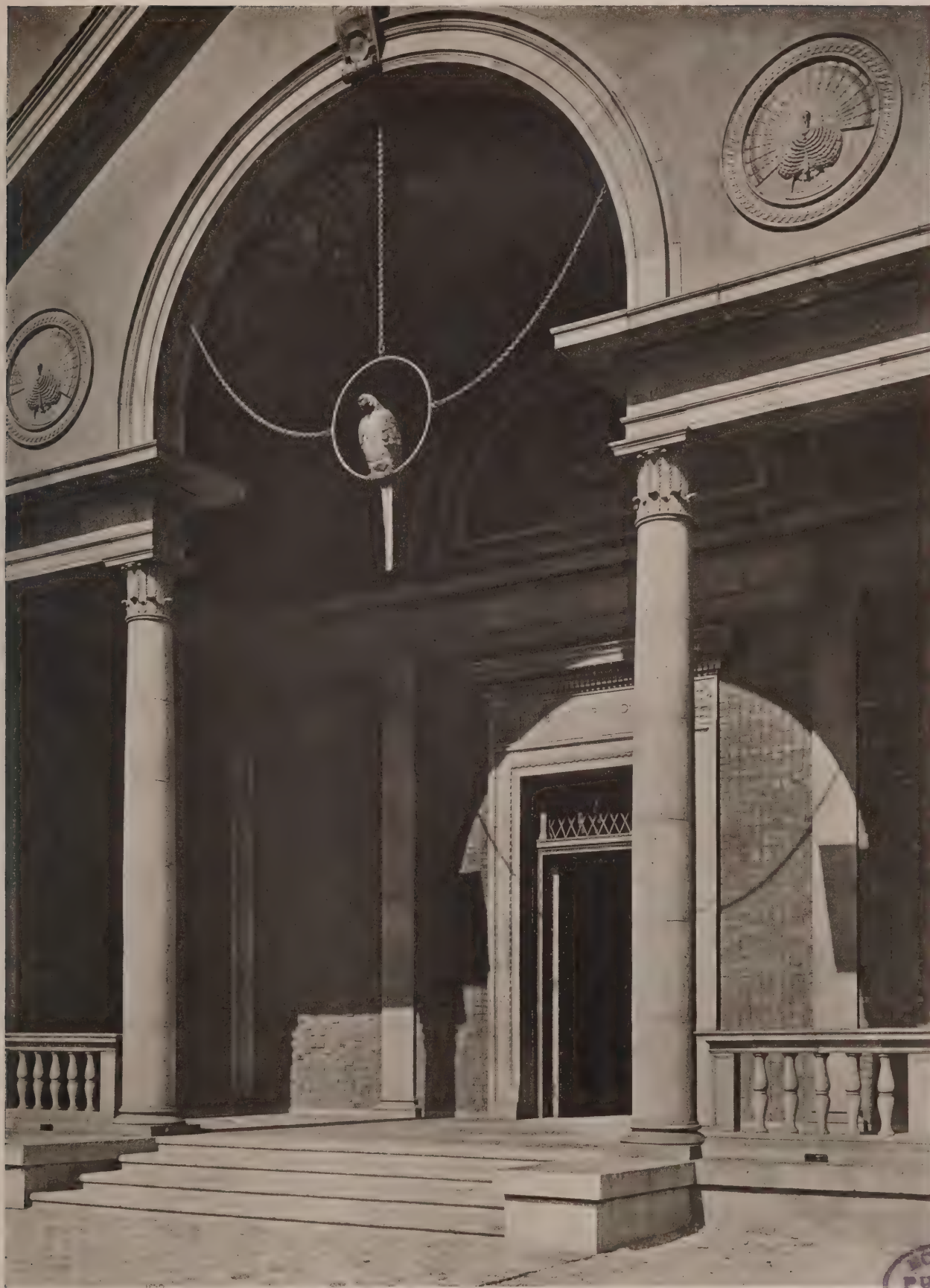
VIEW OF ENTRANCE PAVILION

BIRD HOUSE FOR THE ZOOLOGICAL SOCIETY OF PHILADELPHIA, PHILADELPHIA, PA.

MELLOR, MEIGS & HOWE, ARCHITECTS







DETAIL OF ENTRANCE

BIRD HOUSE FOR THE ZOOLOGICAL SOCIETY OF PHILADELPHIA, PHILADELPHIA, PA.

MELLOR, MEIGS & HOWE, ARCHITECTS

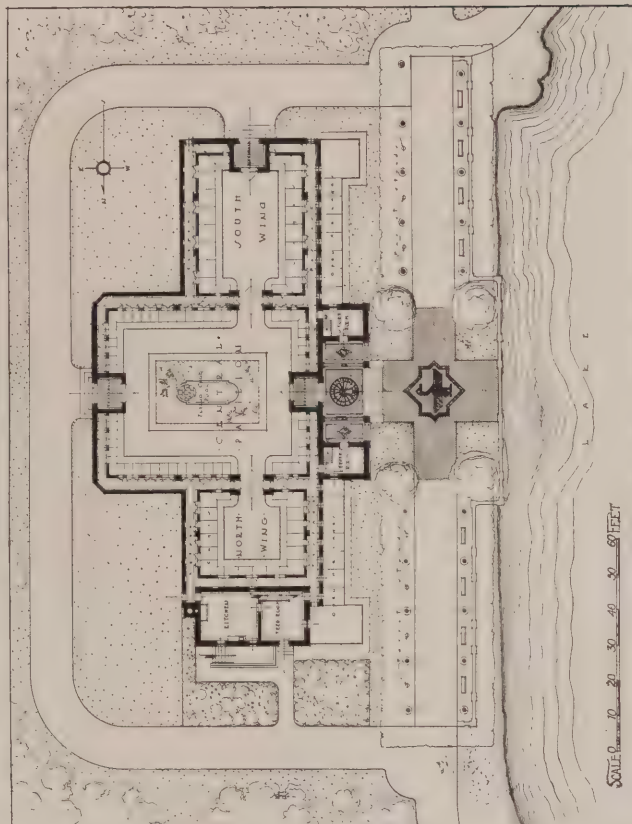








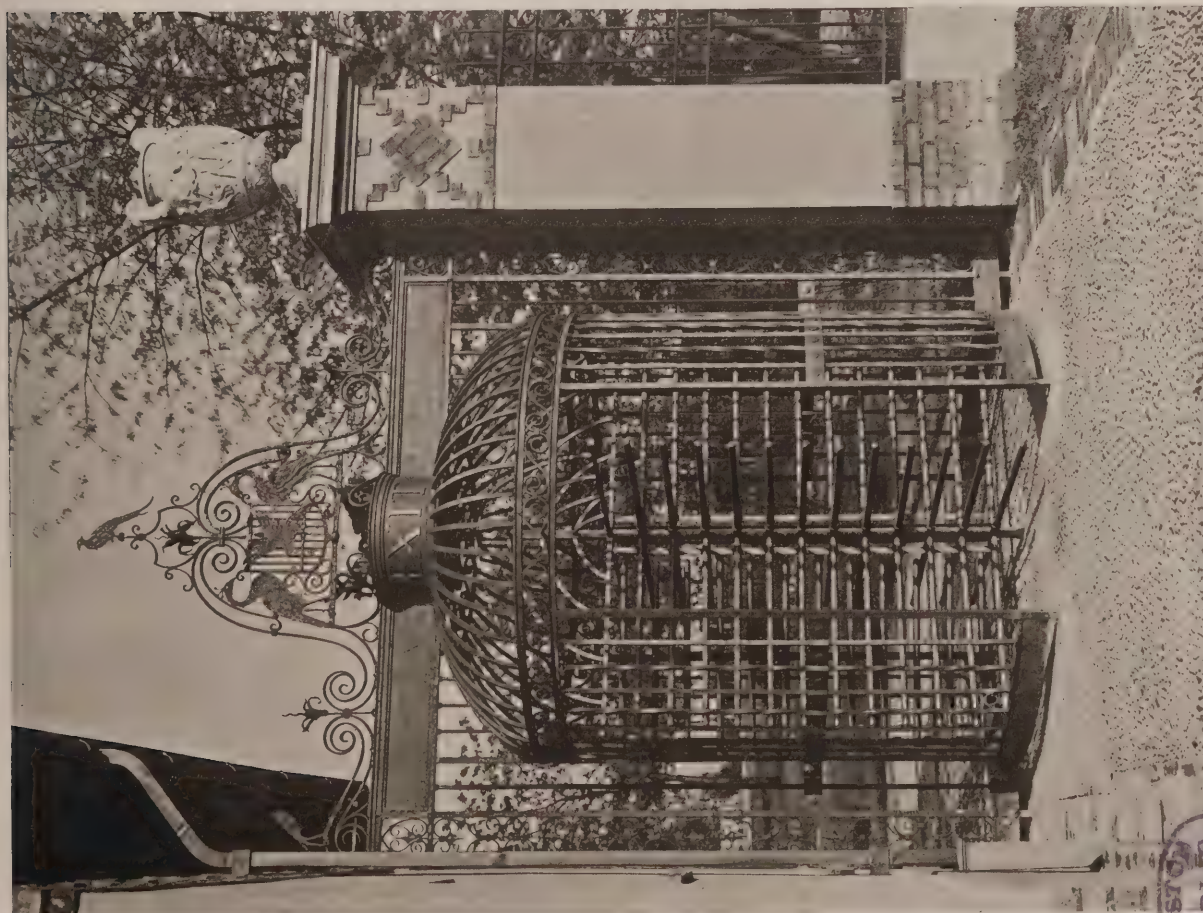
ELEVATION TOWARD LAKE



GROUND FLOOR PLAN

BIRD HOUSE FOR THE ZOOLOGICAL SOCIETY OF PHILADELPHIA, PHILADELPHIA, PA.

MELLOR, MEIGS & HOWE, ARCHITECTS



DETAIL OF TURNSTILE









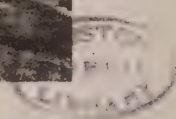
VIEW OF ENTRANCE FRONT



VIEW OF SIDE AND REAR

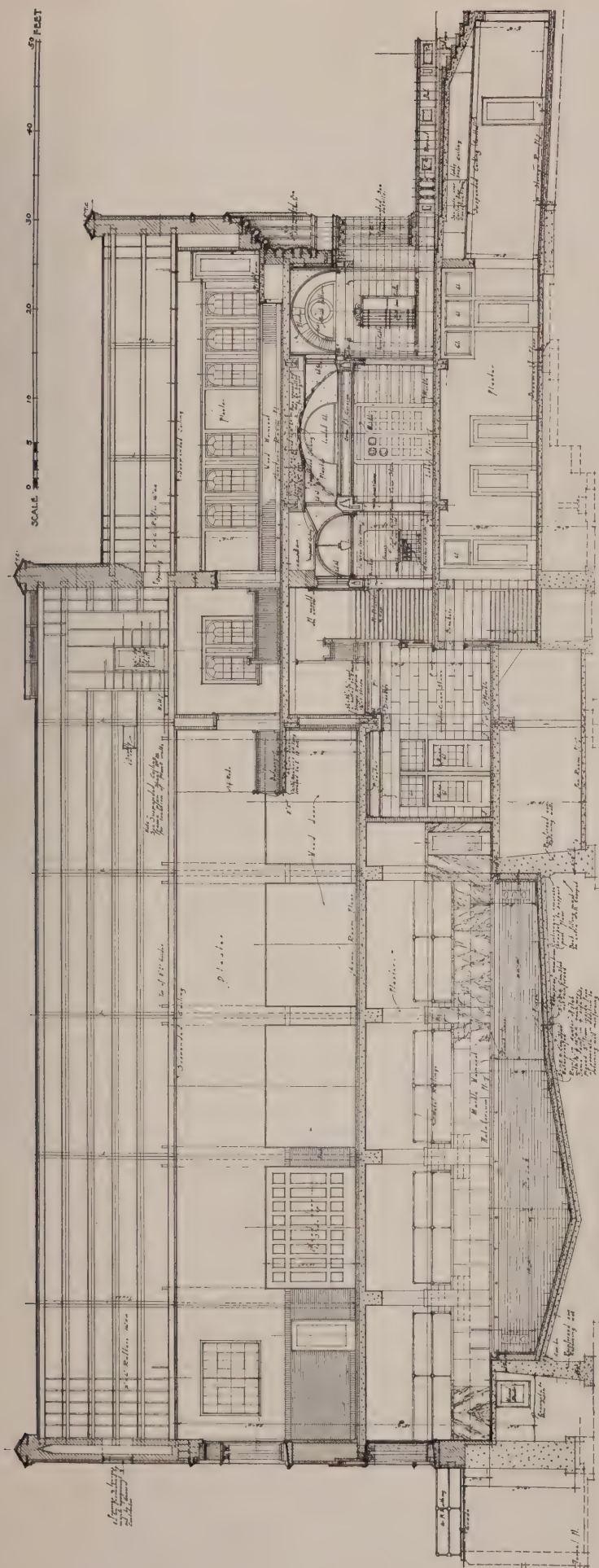
WOMEN'S GYMNASIUM, UNIVERSITY OF MINNESOTA, MINNEAPOLIS, MINN.

CLARENCE H. JOHNSTON, ARCHITECT









LONGITUDINAL SECTION ON MAIN AXIS



BASEMENT FLOOR PLAN



FIRST FLOOR PLAN



SECOND FLOOR PLAN



THIRD FLOOR PLAN

WOMEN'S GYMNASIUM, UNIVERSITY OF MINNESOTA, MINNEAPOLIS, MINN.

CLARENCE H. JOHNSTON, ARCHITECT

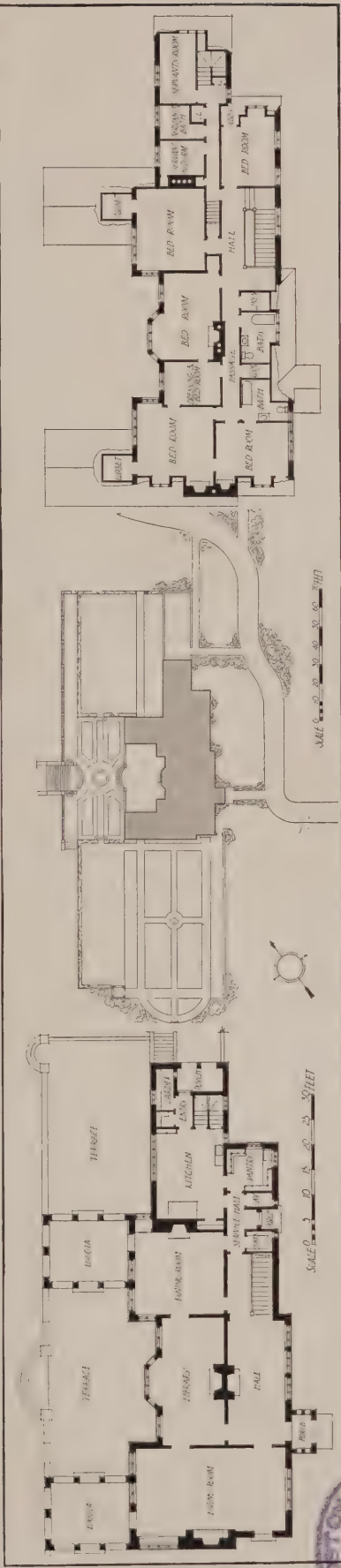








GENERAL VIEW OF ENTRANCE FRONT



FIRST FLOOR PLAN

HOUSE OF MISS ANNA M. STEENKRON, SAUGERTIES, N. Y.  
HENRY CORSE, JR., ARCHITECT

SECOND FLOOR PLAN







VIEW OF SIDE TOWARD GARDEN



VIEW OF TERRACE FRONT

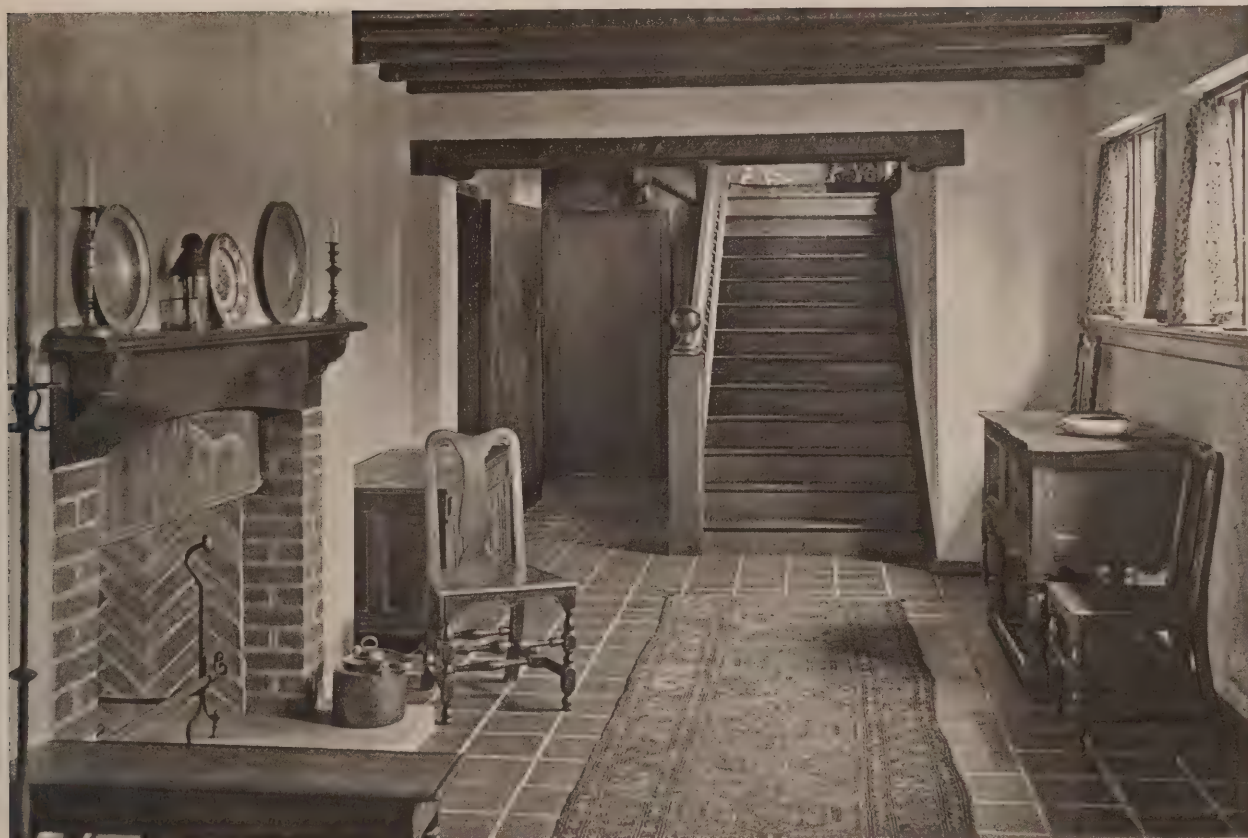
HOUSE OF MISS ANNA M. STEENKON, SAUGERTIES, N. Y.

HENRY CORSE, JR., ARCHITECT









ENTRANCE HALL



LIVING ROOM

HOUSE OF MISS ANNA M. STEENKON, SAUGERTIES, N. Y.

HENRY CORSE, JR., ARCHITECT







## A Hillside Garden

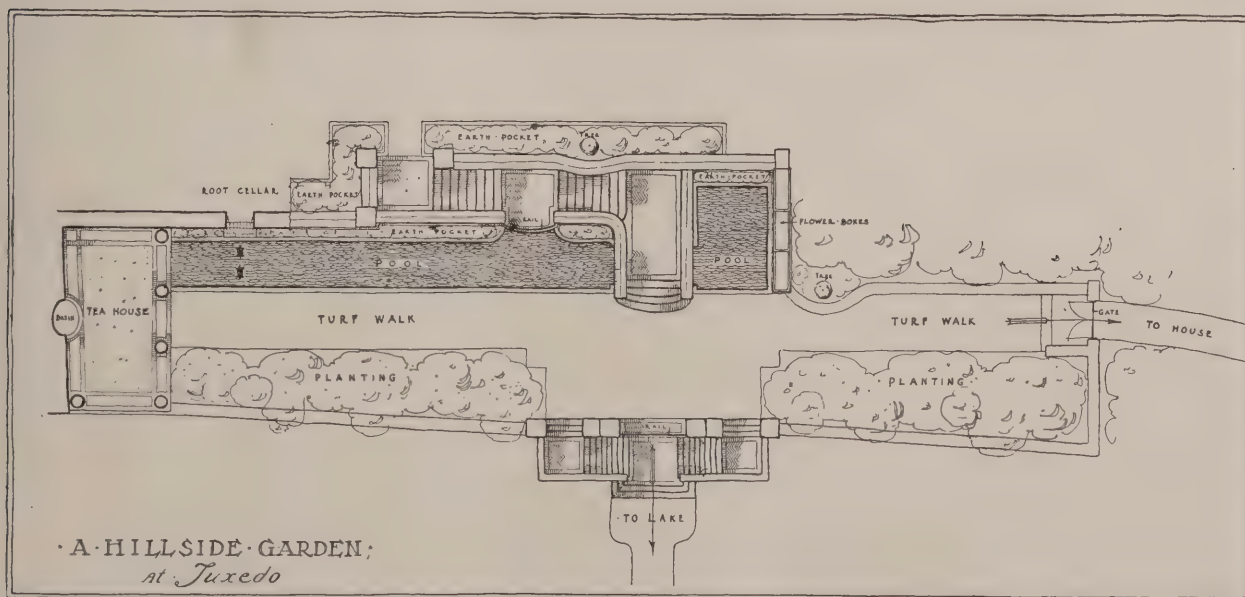
ESTATE OF H. H. ROGERS, ESQ., TUXEDO, N. Y.

WALKER & GILLETTE, ARCHITECTS

THE garden shown in the accompanying illustrations is situated on a hillside that overlooks Lake Tuxedo, grading rather sharply down to the water's edge. Its setting is a terrace formed by a high retaining wall on the upper side and a smaller wall on the lower side. At no point, however, is the work of retaining strongly in evidence as the clever introduction of features serves to give the whole scheme a most natural effect. A point worthy of mention is that the work was accomplished by

Italian laborers working under the direction of the architects on the site, few office drawings having been necessary.

The provision of water at the side of the turf walk after the manner of a moat is a medium for catching the reflections and sparkle of light and shade. The stucco walls have been given a rough texture that invites the cool mosses and clinging vines. The fountain, water head, wrought iron gate, and other features have been incorporated into the scheme with an easy and graceful



Plan of Garden at Tuxedo, N. Y.





DOOR TO ROOT CELLAR

GARDEN OF H. H. ROGERS, ESQ., TUXEDO, N. Y.  
WALKER & GILLETTE, ARCHITECTS



FOUNTAIN IN TEA HOUSE



manner that makes them take a proper place in the setting. The tea house at the end of the turf walk is floored with tile and the rough textured stucco walls are decorated at the upper part with a free Italian rendering of festoons of birds, flowers, and masks in color.

A general color scheme has been observed not only in the architectural features but in the planting as well. The predominating colors are mauve and turquoise blue, the soft gray pink of the stucco affording a foil against which the bright blue flowers in the borders stand in contrast. The tiling in the long pool is of turquoise, making the expanse of water a brilliant note.

A pleasing feature of utilitarian intent is the root cellar, built into the side of the hill, with



Steps to Upper Terrace

terns at intervals. An iron rail on one bows out slightly to permit of a glance into the pool below.

The masses of planting are commendable in their fitness and relation to the architecture, and complete the effect of extreme simplicity and good taste. The spouting of water, the sheen of mosses, the ripple of breezes in the vines, and the patches of sunlight in the pool, all contribute to make this an ideal resting spot.

its doorway across the pool, savoring of old Spain. Two stone turtles with their backs above the shallow water afford a means of crossing to the ledge in front of the door. Rising gently from the terrace, brick steps with heavy tile ramps lead up to the high land above. These brick steps, the one other note of color, have landings paved in pat-



Interior of Tea House





VIEW LOOKING TOWARD TEA HOUSE



WROUGHT IRON ENTRANCE GATE



FOUNTAIN HEAD OVER POOL

GARDEN OF H. H. ROGERS, ESQ., TUXEDO, N. Y.

WALKER &amp; GILLETTE, ARCHITECTS



# The Artistic Expansion of Architectural Clay Products

ITS DEPENDENCE ON THE ARCHITECT FOR DIRECTION IN STYLE AND TREATMENT

By LEON V. SOLON

WHEN an industry embarks on a policy involving the cultivation of an art influence, it is beset with the necessity of mapping out that vague territory separating utilitarian purpose from art impulse. Commercial enterprise is more likely to find a response to its overtures in the art of architecture than from those arts activated by abstract influences, unrelated to everyday requirements.

Our present consideration is to attempt a general analysis of relations existing between potter and architect, with a view to discovering opportunities that may be mutually beneficial. At first glance, the respective attitudes of architect and manufacturer would justify one in assuming that a separate existence had been determined upon as a general policy, leaving any points of contact to the hazards of coincidence. The producer constantly lavishes thought, energy, and capital on efforts for which no place can ever exist in any orthodox architectural conception. The architect, on the other hand, lacks certain textures and treatment; were the technician only acquainted with their nature he could often satisfy these desires at the expense of a little ingenuity.

An alliance between an industry and architecture naturally implies that certain ideals and standards must be shared in common. The establishment of these aims, and the paths to be followed to realize them must be determined by the architect in his capacity of originator. The area covered by these points of joint interest is so vast and their nature so abstract that the commercial mind exercised in concrete problems has great difficulty in analyzing and grasping them alone. Progression under these conditions is bound to be negligible; business-like deduction is a poor guide in those fields where an unerring instinct is needed, and where the exercise of restraint is often more productive than the expenditure of violent energy.

The willingness of the manufacturer to make innovations cannot be questioned. The profusion of essays, inadequate and tasteless as they frequently are, absolve him from any suspicion on that score. Each year he must modify the appearance of certain of his wares. It would be to his advantage to know definitely what type of decoration would be most acceptable, sales would be assured by following it; but, as there is no bureau of information on the subject, the designer, in-

structed by the salesman, does his best, often in an atmosphere of complete artistic isolation.

Evolution of methods affecting business procedure, has rapidly modified the relations of architect, client, general contractor, and producer, necessitating changes in the latter's policies, points of contact, and ethical aims.

A growing prejudice on the part of the majority of clients to stereotyped design, and the strong appeal made by motifs showing individuality, lays a stress on the architect which must be adequately met if the impetus of success is to be maintained.

The thoroughness with which a building is now contrived in every detail entails thought and responsibility for many things formerly controlled by the general contractor. High standards in design and craftsmanship are being established by the architect as a result of active professional competition. He may no longer regard the efforts of the staff designer with complacency for purposes supplementing his own expert achievements. An appreciation of the value realized by suitable treatment of material, both in process and ornamentation, makes it self-evident that the best cannot be realized by rare or occasional contact, and that much benefit can be derived from collaboration with those who by environment and concentration have specialized.

To meet this condition, certain industries whose commercial prosperity is effected by their artistic status, have found it advantageous to change their point of contact, by placing an expert art department in direct touch with the architect, where formerly that of the sales department only existed.

The more abstract the problem — and none is more so than an indefinite desire for decoration — the greater the advisability for close contact between art department and architect. A multiplicity of interpretations can be generated by a competent designer from a description of requirements transmitted by a third party; the chances against a thoroughly satisfactory scheme being worked out are in proportion to the number of solutions that professional versatility can devise.

This point is worthy of consideration, if only from its bearing on the simplifying of means for obtaining decisions from clients. Skilful diagnosis and inoculation will always be the main factors in successful handling; the diagnosis being arrived at by a process of subtle suggestion on the

part of the architect; the inoculation being performed with a serum of tempting propositions, injected into the weakest spot.

By direct contact with the craftsman, suggestions tentatively proposed can be developed and invested with the most effective interpretation the craft can evolve, thus giving forcible emphasis to the proposition.

Collaboration of this description would materially assist the clay industry in its artistic expansion. Its initial sphere of activity is mechanical and chemical rather than artistic; of itself it can produce only beautiful elements which are means to an end, until combined and treated by the constructive perception of architect and artist.

The industry has many points enormously in its favor; the fact has long remained unchallenged that fired and glazed clay is the only medium holding adequate solution for architecture's most fascinating problem—the use of polychrome. Interest has rapidly grown among architects of recent years despite the meager facilities available, and a rather half-hearted and confused co-operation on the part of its producers.

Unlike the majority of the crafts, the potter's art is a sealed book to the layman. Involved in a multiplicity of mechanical and technical intricacies, the energy of the uninitiated is bound to exhaust itself in unfeasible suggestions. From this it is obvious that new decorative effects, revivals of useful methods from classic sources, and greater facilities for the use of polychrome, must emanate from the industry itself, along lines determined by the architect.

The question of color is the one which has the first claim on our earnest attention, owing to its difficulty in satisfying the expectations it excites, and to the fact that on this development depends the extent to which faience will be identified with architectural progress.

Color sense is not a factor in any way essential to an architect's professional equipment, as it is to that of all painters and many designers; in fact, a large proportion of architects in the front rank of their profession are deficient in this sense (as are the majority of sculptors)—without their work suffering depreciation thereby. It is reasonable to deduct that an essay in color harmony by the many architects is often a sudden and comparatively unprepared excursion into a field needing life-long concentration and a special gift. Assuming this to be the case, what practical assistance has the technician devised, by which an architect may promptly and successfully surmount his difficulties? From all accounts the same obstacles

confront the architect to-day who wishes to introduce polychrome into his design that puzzled the profession ten years ago. Some, carried away by their enthusiasm as pioneers, made ambitious attempts, which were later to be cited as concrete proof, demonstrating that the artistic limit of the product had been reached, and found wanting.

The color position is due to the following fact:

The ceramic palette is at present composed of an accumulation of unrelated trials, produced without any idea that a palette should exist as a complete unit, comprising positive colors, foils, and blending tints—all related, and created to fulfil definite scenic requirements.

The ceramic color-maker has devoted his main effort to producing positive tints of the maximum purity, oblivious of the fact that in decoration, generally speaking, these colors can only be used with success, as accents to those quieter and more neutral tones which will always prevail.

The ceramic palette should have for its main divisions, the positive, composite, and neutral.

Each color according to its intensity, should be represented by from two- to four-tone values, as it frequently happens that, though the preliminary assembly of colors promises well, on its application to the detail the decorative balance is upset, by certain items becoming excessively or insufficiently prominent; a change of tone value in the disturbing color will rectify this. In many other ways can time and trouble be saved and effects improved by a graduated color scale, due to the fact that environment and the relative proportion of areas, exert a very pronounced influence on the apparent strength of tints. For the guidance of architects it would be quite feasible for the producer to establish standardized color harmonies, reproduced by color-process ready for filing; showing colored sections of friezes, mouldings, caps, or other frequently recurring details; these covering a sufficient variation of design to give him latitude to choose the type, harmony, and color balance most nearly related to his scheme. By this means any architect unskilled in the use of color might find a safe foundation from which to start, involving the expenditure of little more energy than is needed to choose a rug or hanging.

An analysis of color harmonies identified with many historic types of ceramic art points to the conclusion that the establishment of color systems must have been a common practice in the past.

The majority of the palettes of ancient polychrome pottery, though limited in range, were well balanced, and did not in any way represent the total of technical achievement of their day.



In each, the decorative aims of the period were so well anticipated that painters could produce eminently satisfactory results almost by formula. The prompt establishment of corresponding facilities by the faience industry to-day appears to be one of its most urgent needs.

The time is passed when technical excellence alone was an assured channel of commercial prosperity, in lines other than staples. In the clay industry of recent years a somewhat malignant influence has asserted itself, placing a premium on methods adjudged meretricious, and bad by every established ceramic standard. This started as an echo of the English Arts and Crafts movement, organized as a protest against the elimination of the mark of handicraft by mechanical systems; but, misunderstanding the original aims, the "primitive" was effected at the complete sacrifice of all real craftsmanship, so far as tile was concerned. These clumsy attempts were heartily welcomed by many architects who, being compelled for certain purposes to use tile in a *milieu* comprising objects that emphasized the peculiar character and beauty of different materials, found in these tiles an expression of plasticity and a texture which had been carefully obliterated from the commercial product. The only alternate previous to the vogue for this type of treatment was the regular commercial tile, the decoration of which was evolved in factory drafting room insulated from every artistic influence; the technical perfection of this article made its decorative shortcomings all the more inexcusable.

Some extreme of a corresponding nature may before long invade the terra cotta and faience field with disastrous results to industrial standards, unless new decorative horizons be revealed, stimulating the imaginative energy of the architect and proving that this art does not depend on the mishandling of clay to invest it with interest.

The use of polychrome in terra cotta so far appears to have but two methods of application—the coloring of reliefs and the insertion of the colored unit. Recent development has been pushed mainly in a direction which is the exact opposite of its natural sphere. With every tradition in the potter's history of infinite artistic variety and individual beauty, its producers now aim at imitations of another material.

The imitation of stone is in itself an interesting technical achievement, but does not stimulate the imagination to any architectural development of which clay alone is capable. Trend of thought in art is enormously influenced by initial suggestion; an architect is more likely to develop in his

design the peculiarities of the substance imitated, than to evolve forms characteristic of the actual material, particularly when the technique of each is as remote as granite is from clay.

Surely, the magnificent heritage left us by potters of all nations must contain some suggestions of value, in accord with the standards and requirements of our contemporaries. Why should not the potter of to-day do as his predecessor in the days of the Italian Renaissance, who, noting the decorative value of sgraffito on the façades of his city, translated the effect to his craft, making an imperishable version of a fugitive method. This he adapted to beautiful vases and plaques, many of which can be seen in European museums. The pieces were usually of a red body, which when still "green" (moist) were dipped in a cream "slip" (liquid clay). When the cream coating was sufficiently set to handle, the design was traced, outlined with a sharp tool, and the ground scratched away, leaving the ornamentation in very slight relief against the dark ground.

This simple method should open a vast field to the architectural designer, already predisposed to the process by the vogue accorded to the cement sgraffito. It would be applicable to friezes, pilasters, tympanums, panels, decorated column shafts, soffits, and for innumerable other purposes; giving an effect of rare quality at a comparatively low cost and having the great advantage of pliability to ornamental variation.

Polychrome features could be developed in this process by the use of multi-colored slips on the natural colored ground; when finished with a semi-transparent mat glaze, great delicacy and architectural value could be easily realized.

The history of ceramics abounds in instances of potters seeking ideas in other crafts, and thereby adding interesting and individual methods to their repertoires. As an illustration there might be cited the instance of that mysterious and rare ware, known first as Faience of Henri II, and later as Faience of Oiron. The detail of its ornamentation is similar in conformation and scale to that devised for the decoration of leather book-bindings of that period. Logical deduction, in the absence of historical data, supports the inference that an imaginative and versatile potter, on seeing the manipulation of tools in the book binding craft, conceived the idea of using them as dies with which to impress patterns in the clay, filling in the incisions later with a dark clay, as the binder had done with gold. By a revised application of this principle, it should be possible to create a very individual architectural embellish-

ment of much delicacy and precision. With regard to the choice of a type of ornamentation with which to demonstrate the decorative value of a new process, it is usually a sound policy, when feasible, to start by identifying it with some classic ornamental method of incontestable excellence. In this particular case the treatment most likely to receive professional endorsement would be derived from those delicately silhouetted marble inlays seen in certain mouldings in Italian Renaissance churches.

From the inlayings of clays, the mind seeking new fields, by automatic impulse travels in the opposite direction. This new direction covers the many ways in which an ornament in colored clay may be affixed to a ground; ornamentation acquires a totally different decorative quality when treated in this manner, from that which it assumes when it is drawn from the mould incorporated with the ground, and afterwards colored.

The exquisite effects produced by Wedgewood in this manner seem to hold out a promise that some day they will inspire an architectural ceramist to produce a beautiful and distinctive embellishment for interior ceramic decoration, of such modified form and scale that the derivative will no longer be traceable in the new type created.

Further development of this method could extend to many popular phases of decoration, for the correct translation of which, faience has the means of expression. It would render with much feeling the frail delicacy of the Chinese Chippendale; the picturesque detail of the Elizabethan and Jacobean, and the scattered motifs of the Charles II period could be made very valuable for purposes for which the severer classics are inadvisable.

This meager insight into the decorative possibilities of faience may stimulate thought and encourage future effort; but there are certain points which the technician should put before the architect which will enable him to judge the technical merit of different grades of the product.

The hand-made faience tile is produced by simple and almost archaic methods. The clay after preparation is beaten out on a smooth bed and sliced off with a wire to the desired thickness. This clay is a mixture, into which ground pitchers are introduced; the reason for this addition is that the body is rendered more rigid at a high temperature by having a certain proportion of its bulk freed from contraction by a previous fire. It permits a temperature to be reached with safety which would distort and warp the natural clay. This type of tile, made of hand-beaten clay, cut by hand, showing the rough wire-cut back, should be

the only one to which the name of faience rightly belongs. Unfortunately, the vagueness of this term has permitted its application to products made by machinery, either of compressed clay dust, or of plastic clay manipulated mechanically.

In the former process the clay is deprived of its plasticity by drying, is then ground to dust and shaped by compression in dies. These can easily be identified by the smooth surface left on the reverse of the tile by the back-plate of the die.

A totally different machine is used for the plastic repressed tile. Plastic clay is fed to the machine which resembles in general principle the domestic mincing-machine. The clay leaves the machine on a belt through a gauge giving the width and thickness of the tile, and is automatically cut into squares. These squares are next placed into another machine to true them by pressure. This type of tile may usually be recognized by a trace of the paper, put at the back of the clay to prevent sticking to the die, which shows on the edge.

These points are worth noting, as they constitute simple methods of identification which place the architect in a position where he is independent of assurances by interested parties. A general knowledge of material with simple methods of judging grades of quality are necessary to give the architect that confidence which must accompany all new experiments.

A vast resource of rich inspiration lies fallow, which, if judiciously applied would assure the investment of considerable industrial energy. Wherever ceramic art has reached its highest attainment it has been by the combined effort of artist and potter—the beauty of the material developing in proportion to the artist's skill.

Commercialized methods are not to be blamed entirely for the separation of art from many industries. Its elimination dates back in many cases to about the middle of the nineteenth century—to the period when modern economic principles appear to have been first instituted in business organization. Everything in any way connected was weighed on its merits, and, as at that time art in every country happened to be at its lowest ebb, its existence was not justified—a condition which fortunately no longer exists.

Ours is the age for the co-operation of specialized effort. An era has just dawned and much will be achieved in this country that will be handed down with honor to posterity. The potter hopes that our day may see architecture graced by the use of the humble clay, and that it may help to establish, beyond argument, that no material is gross that is touched by art.



THE FORUM COLLECTION OF  
EARLY AMERICAN ARCHITECTURAL DETAILS

PLATE FORTY-FOUR



*THIS house, built about 1800 by Langley Boardman, is one of the simplest and most beautiful of the square, three-story type of early residence in New England. The facade is distinguished by the curved porch supported by graceful attenuated*

*columns. The delicacy of the mouldings and simplicity of composition are in complete accord with the house. The door itself is mahogany, with an inlaid oval of whalebone in each of the six panels. The walls of the house are covered with plain siding.*

ENTRANCE PORCH, LANGLEY BOARDMAN HOUSE, PORTSMOUTH, N. H.

Built about 1800

MEASURED DRAWING ON FOLLOWING PAGE





# New Dormitory Group at Cornell University

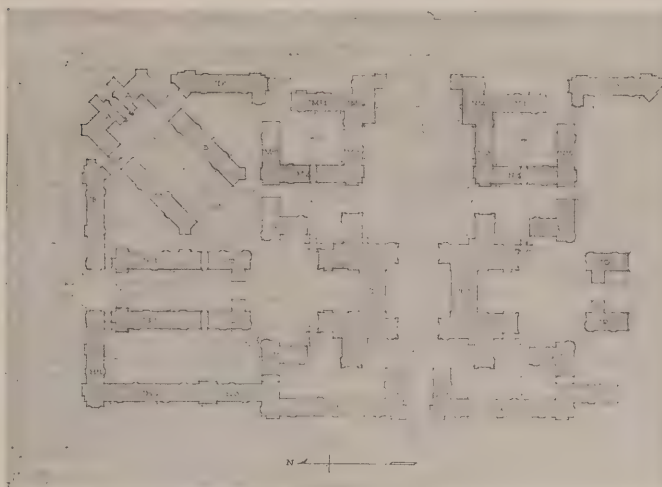
DAY & KLAUDER, ARCHITECTS

THE site occupied by the new Cornell dormitories consists of a tract 1,000 by 600 feet in area, the center of which lies about 100 feet below the level of the campus, and the land, together with the buildings on it, is completely overlooked in the view from the campus to Lake Cayuga. By a steep pathway from the northeast corner of the site,

important academic buildings on the campus above are reached. A station of the street car line is to be located near the center of the southwest border of the tract, at the end of the axis across the tract and coinciding with the library tower on the campus above. Considerable traffic will eventually move diagonally across it, and this suggested the diagonal axis through and between three of the buildings which comprise the portion of the group as now built.

The architects were obliged to meet the condition that there must be sunlight in every room of the group during some part of each day, and placing the long axis of the buildings, which are not more than 32 feet wide, north and south, with rooms on each side, effected the desired result. Another condition was that the buildings should not be too long—or, in other words, that there should not be unlimited continuity in the line of the buildings, as is so often found in dormitories in the Collegiate style here and in England. Separation for the free passage of air was necessary.

In working out the plans the architects regarded these conditions as assets in the design and they were of considerable influence in giving the group many distinctive characteristics. Thus, because of the openings between units, the use of gabled copings at the ends of the buildings was not adopted, inasmuch as such a device would too definitely determine the individual buildings, and so cause agitation by reason of the light color and prominence of the many copings. By the absence of such a treatment, a certain austerity



Plot Plan of Proposed Dormitory Group at Cornell University  
Day & Klauder, Architects

*The group about the diagonal axis at upper left-hand corner has been completed  
The total capacity of the entire group will be 1,600 men*

was gained, which is common in the best English work, and at the same time the cost of the dressed coping stones and the copper flashings necessary with that treatment was saved.

A natural condition was the fact that the lot, while approximately level from north to south, had a fall of 60 feet in its width. The architects determined upon a divi-

sion of the plot into courts to accommodate all of the contemplated buildings as shown in the plot plan reproduced herewith. It was found that the width, or east and west dimension of the lot, would permit of approximately five of these, and in dropping each court 10 feet, the problem of grade was solved. Story heights have generally been made 10 feet from floor to floor—9 feet in the clear, consequently a design with a wall containing three stories of windows on one side and two stories of windows on the other, seemed a perfectly natural outcome. It gives the informal character so desirable in this style, with the grace and impression of having been caused by natural conditions.

Another important asset was the stone used in the structures. There was at Cornell a quantity of stone which seemed to the architects a perfect building material that previously had been used only in dry retaining walls, with no thought of its suitability for the finished walls of buildings. Upon opening a quarry near by, sufficient stone was discovered, not only for the entire group of buildings designed to occupy the present tract, but for other future buildings elsewhere on college property, and this at a minimum expense to the institution and a maximum effectiveness in the character and beauty of the buildings. It is a slaty stone, exquisite in color and is laid on its natural bed, as may be seen in the illustrations. The face is the natural seam face, which is perfectly straight and plain, but upon being laid, at once assumes the quality of age which is so vital to the appearance of these buildings.

## EDITORIAL COMMENT

WITH large numbers of men entering the service of the Government, and the consequent decrease among those engaged in civil occupations, manufacturers and building contractors are realizing the great scarcity of trained mechanics. The lack of skilled labor in the building trades has for some years past been very marked, and in addition to seriously hampering speedy construction, it has also served as an important contributing factor to the advance in the cost of building.

Immigration has now, of course, been reduced to a minimum figure, but even under normal conditions in years previous to the war, the acquisition of mechanics through immigration was slight; the really skilled workers found ample employment in their own countries and only the poorly equipped came here. The result has been, especially in the East, that there has grown up a class of foreign-born inferior mechanics which has had the evil tendency of lowering our already sinking standards of craftsmanship. Every architect has had many occasions to regret the low quality of craftsmanship he must accept if his building is to be turned over to the owner on schedule time, but with conditions as they exist there is no alternative. The great number of mechanics now required for government construction, in addition to the numbers called into the service, places a decidedly serious aspect on the situation and makes it imperative that immediate steps be taken to recruit workmen who can meet the abnormal demand for labor in the building field, certain to take place with the close of hostilities.

The general decline in the quality of labor began with the advent of machinery during the latter half of the nineteenth century, and the minute subdivision of work which followed as a natural sequence. The decline was further hastened by restrictions of labor organizations governing the number of apprentices and also by the unwillingness of many employers to teach beginners. Previous to this, most workmen were masters of the craft in which they were engaged, and in the old labor guilds a man could not become a member until he had passed through all the stages of development. Some method of education, whether within the occupations themselves or not, must be devised which will approximate in its effect the former standards of craftsmanship secured through the guild system.

In the manufacturing field the shortage of skilled labor has not been overlooked by intelligent employers and at the present time a con-

ference board, composed of representatives of national manufacturers' associations, is giving consideration to the subject so far as it relates to factory employment. Out of the serious thought and study expended by this board there has been evolved a strong demand for the revival of the apprenticeship system in practically all industries.

Similar attention should be given to the development of building mechanics for, at the close of the war, if the demand in numbers for such men will not be more than for men in manufacturing enterprises, the demand for better skilled workers will certainly be greater. It is the patriotic duty of every one concerned with building to undertake at once the promotion of any means which will aid in filling the vacancies now apparent in the ranks of artisans and to raise the standard of skill in the various trades. The public and semi-public trade schools which have been established in recent years are doing good work but their activities can still be greatly increased and a closer cooperation between them and the industries brought about to the ultimate benefit of thousands of young men who now end their school life without any specific or direct training for the work they are to do. The promotion of skill in building mechanics is an urgent demand of the time and in as much as the successful outcome of the architect's work is so dependent on the mechanic, it is a problem of vital interest to the practise of architecture and worthy of the concerted action of the profession.

### NATIONAL HOUSING CONFERENCE

IN view of acute conditions arising from housing shortages in almost every American industrial center which has been boomed by war industries, announcement of the Sixth National Housing Conference on Housing in America assumes unusual interest. The conference will take place in Chicago, October 15, 16, and 17 at the Hotel LaSalle, under the auspices of the National Housing Association.

Discussion will center on the various problems of industrial housing and some of the country's leading experts in this field will contribute papers. Among the subjects to be taken up are, "How can We Cheapen the Workingman's Dwelling," "The Best House for the Small Wage Earner," "The Housing of the Single Worker," and the manner in which Bridgeport, Conn., which practically doubled its population in a year's time, grappled with its housing problem.



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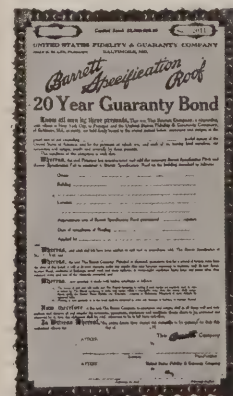
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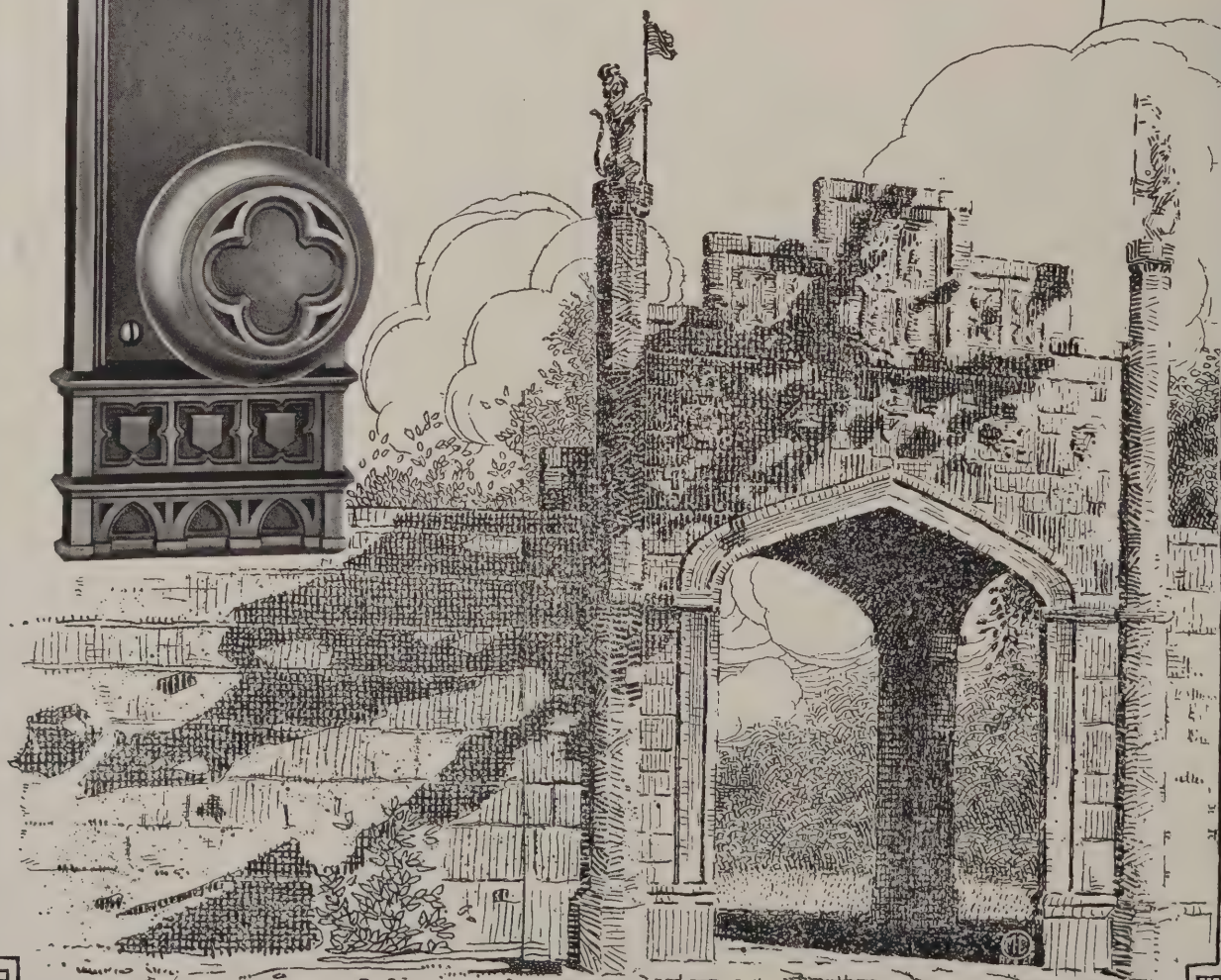
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| Bodwell Granite Company                  | Rockland, Maine        |
| Booth Bros. & Hurricane Isle Granite Co. | New York, N. Y.        |
| H. E. Fletcher Company                   | West Chelmsford, Mass. |
| John L. Goss Corporation                 | Boston, Mass.          |
| Lemmerman & Hoffman Granite Co.          | Mt. Airy, N. C.        |
| Lovejoy Granite Co.                      | Milford, N. H.         |
| Maine & New Hampshire Granite Corp'n.    | North Jay, Maine       |
| The New England Granite Works            | Westerly, R. I.        |
| The North Carolina Granite Corporation   | Mt. Airy, N. C.        |
| Rockport Granite Co.                     | Rockport, Mass.        |
| J. C. Rodgers & Son                      | New York, N. Y.        |
| J. D. Sargent Granite Co., Inc.          | Mt. Airy, N. C.        |
| The John Swenson Granite Company         | Concord, N. H.         |
| Webb Pink Granite Co.                    | Milford, Mass.         |
| Woodbury Granite Company                 | Hardwick, Vt.          |

# Selected List of Manufacturers' Publications

FOR THE SERVICE OF ARCHITECTS, ENGINEERS, AND CONTRACTORS

The publications listed in these columns are the most important of those issued by manufacturers represented in the advertising pages of THE ARCHITECTURAL FORUM. They may be had upon direct application to the manufacturers.

## ARCH CONSTRUCTION, TIMBREL TILE

**Guastavino Co., R.**, Fuller Building, New York, N. Y.  
Portfolio. 10½ x 13½ in. Plates.

## BRICK

**American Enameled Brick and Tile Co.**, 52 Vanderbilt Avenue, New York.  
Enameled Brick. Catalog. 6 x 9½ in. 25 pp. Color plates.

**Claycraft Brick Co.**, 907 Hartman Building, Columbus, Ohio.  
Booklet. 6 x 9 in. 39 pp. Plates showing examples of work.

**Hydraulic-Press Brick Co.**, St. Louis.  
Bonds and Mortars in the Wall of Brick. Treatise on brick design. 8½ x 11½ in. 27 pp.  
Brick Scales and Tables. Fifteen scales for vertical and horizontal measurements, with explanatory booklet and tables. 8 x 10 in. 32 pp.

Moulded and Ornamental Brick. Catalog. 4½ x 6½ in. 140 pp.  
The Hy-tex House of Moderate Cost. Booklet. 8 x 10½ in. 100 pp. 80 sketch plans and elevations.

The Brick Church and Parish House. Book of designs with floor plans from drawings submitted in competition. 10½ x 13½ in. 80 pp.

**Sayre & Fisher Co.**, 261 Broadway, New York.  
Brick — Enameled and Front. Catalog. 6 x 9 in. 24 pp. Color plates.

**Western Brick Co.**, Danville, Ill.  
The Art of Stippling. Brochure giving history of development of stippling and its application to face brick. 4 x 6 in. 24 pp.

## CEMENT, PORTLAND

**Atlas Portland Cement Company, The**, 30 Broad Street, New York.

Handbook and Treatise. Concrete in Factory Construction. 6½ x 8¾ in. 250 pp.

Early Stucco Houses, with modern stucco specifications. Booklet. 8½ x 11 in. 24 pp.

Choosing the Garage, describing actual construction. Booklet. 8 x 10½ in. 26 pp.

Commercial Garages, with construction notes and architectural treatment. Booklet. 8 x 10½ in. 12 pp.

Color Tones in Stucco. Booklet with colored plates. 8½ x 11 in. 24 pp.

Building a Bungalow. Booklet. 8½ x 11 in. 18 pp. 4 color plates.

**Lehigh Portland Cement Co., The**, Allentown, Pa.  
Forty-one Concrete Reasons. Booklet. 6 x 9 in. 34 pp.

Cement Facts. Booklet. 5½ x 6½ in. 18 pp.

The Expense-Proof Farm. Booklet. 6 x 9 in. 100 pp.

Lehigh Portland Cement. Illustrated. Booklet. 8½ x 12½ in. 42 pp.

**Sandusky Cement Co., The**, Dept. S., Engineers Building, Cleveland, Ohio.

Medusa White Portland Cement. Booklet. 8½ x 11 in. 52 pp.

Medusa Waterproofed White Portland Cement. Booklet. 6 x 9 in. 20 pp.

Medusa Waterproofed Gray Portland Cement. Booklet. 6 x 9 in. 20 pp.

## CHIMNEYS

**Heinicke, Inc., H. R.**, 147 Fourth Avenue, New York.  
Chimneys. Bulletin. Methods of construction.

## CONDUIT

**National Metal Molding Co.**, 1113 Fulton Building, Pittsburgh.

Handbook on National Metal Molding. Complete details and installation instructions. 4½ x 6 in. 96 pp.

Bulletin No. 50. Rigid Conduits. 8½ x 11 in. 12 pp.

## CONSTRUCTION, FIREPROOF

**General Fireproofing Co., The**, Youngstown, Ohio.  
Fireproofing Handbook. 6 x 9 in. 112 pp.

## CONVEYORS, GRAVITY

**Otis Elevator Company**, Eleventh Avenue and 26th Street, New York.  
Otis Gravity Conveyors. Catalog. 6 x 9 in. 56 pp.

## DOORS, WINDOWS, AND TRIM, METAL

**Detroit Steel Products Co.**, 2917 East Grand Boulevard, Detroit, Mich.

The Fenestra Line. Catalog. 8½ x 11 in. 15 sections. Blue prints.

**Lupton's Sons Co., David**, Witte and Tulip Streets, Philadelphia, Pa.

Lupton Service and Products, No. 9. Descriptive catalog with drawings and data for specifications. 8½ x 11 in. 100 pp. and cover.

## DOORS, WINDOWS, AND TRIM, METAL — Continued

**Merchant & Evans Co.**, Philadelphia.  
Red Book. Catalog. 5½ x 8¾ in. 190 pp.

**Trussed Concrete Steel Co.**, Steel Sash, Dept. 57, Youngstown, Ohio.  
United Steel Sash. Catalog. Details and specifications. 8½ x 11 in. 128 pp.

## DUMBWAITERS

**Sedgwick Machine Works**, 182 Liberty Street, New York.  
"Service Sheets." Standard specifications, plans, etc. 16½ x 21½ in.

## ELECTRICAL EQUIPMENT

**Hart & Hegeman Mfg. Co., The**, 346 Capitol Ave., Hartford, Conn.  
Catalog O. H & H Switches and Paiste Wiring Material. 9 x 10½ in. 106 pp.

**Hart Mfg. Co.**, Hartford, Conn.  
"Diamond H" Switches and Receptacles. Descriptive booklet. 4 x 8½ in. 24 pp.

## ELEVATORS

**Otis Elevator Company**, Eleventh Avenue and 26th Street, New York.

Otis Electric Traction Elevators. Bulletin. 6 x 9 in. 28 pp.

Otis Residence Elevators. Bulletin. 6 x 9 in. 16 pp.

**Sedgwick Machine Works**, 182 Liberty Street, New York.  
Selecting an Invalid Elevator. Booklet. 4½ x 8½ in. 8 pp.

## ESCALATORS

**Otis Elevator Company**, Eleventh Avenue and 26th Street, New York.

Otis Escalators. Bulletin. 6 x 9 in. 36 pp.

## FAIENCE, ARCHITECTURAL

**Rookwood Pottery Co.**, Cincinnati.  
Faience Catalog with portfolio of plates. 9½ x 12½ in. 64 pp.

## FLOORING

**Armstrong Cork & Insulation Co.**, 132 24th St., Pittsburgh.  
Linotile Floors. Booklet. 6 x 9 in. 32 pp.

**Kennedy, Inc., David E.**, 55 Fifth Avenue, New York.  
Nonpareil Cork Tile. Booklet showing patterns. 3½ x 5½ in. 34 pp.

Folder showing colors of tiles. 3½ x 5½ in. 4 pp.

Everlastic Tile. Folder. 3½ x 6¼ in. 4 pp.

Mas-Oleum Floor. (Mastic Linoleum.) Folder. Specification Forms. 7½ x 9 in. 4 pp.

**Sonneborn Sons, Inc., L.**, Dept. 4, 264 Pearl Street, New York.  
Lapidolith Specifications. Booklet. 8½ x 10½ in.  
Scientific Investigation of the Action of Lapidolith on Concrete by Prof. R. J. Colony. Booklet.

## GARDEN POTTERY — See Pottery, Garden.

## GLASS CONSTRUCTION

**Berger Manufacturing Co.**, Canton, Ohio.  
Berger's Raydiant Sidewalk Lights. Catalog T. F. 8½ x 11 in. 42 pp.

**Keppeler Glass Constructions Inc.**, Architects Building, 101 Park Avenue, New York.

Bulletin No. 126. 8½ x 11½ in. 12 pp.

Bulletin No. 202. 9 x 12 in. 6 pp.

Bulletin No. 203. 9 x 12 in. 4 pp.

Bulletin No. 205. 9 x 12 in. 6 pp.

**Lord & Burnham Co.**, 42d Street Building, New York.  
Some Greenhouses We Have Built. Illustrations. Completed work. Catalog. 9½ x 12½ in. 98 pp.

## HARDWARE

**Columbian Hardware Co., The**, Cleveland, Ohio.  
Making It Easier to Buy Columbian Sash Pulleys. Folder. 3½ x 8¾ in. 14 pp.

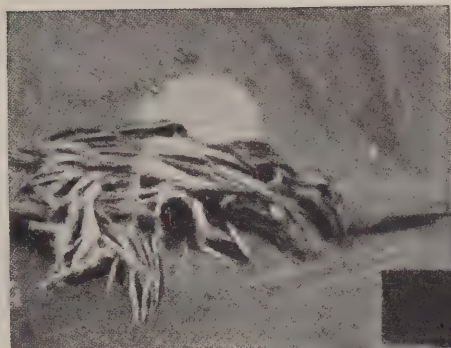
**Corbin, P. & F.**, New Britain, Conn.  
Colonial Hardware. Booklet. 5 x 7 in. 32 pp.  
Corbin Door Checks. Catalog. 5 x 7 in. 40 pp.  
Corbin Door Knockers. Booklet. 5 x 7 in. 24 pp.  
General Catalog. 10½ x 13 in. 1200 pp.



# The Difference

## Wood Piles vs. Concrete Piles

### after they are driven



Examples of Over-driven Wood Piles



PLACING a building upon piles, either of wood or concrete, where the condition of the pile, after being driven, is unknown, is similar to the old schoolboy trick of swapping knives "At sight un-seen." Therefore, why take a chance?

BY the use of Raymond Concrete Piles you can always know the exact condition of every pile placed. Furthermore, know that it is perfect from tip to top. The accompanying photographs indicate the result obtained by chance excavation of wood piles and of Raymond Concrete Piles. Which would you prefer?



What Chance Excavation Revealed — Every Pile perfect from tip to top



A Change in Plans —  
and this is what developed. Every  
Pile perfect — not one not just right

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*A Form for every Pile — A Pile for every Purpose*



SELECTED LIST OF MANUFACTURERS' PUBLICATIONS — *Continued from page 24*

## HARDWARE — Continued

- Reliance Ball Bearing Door Hanger Co.**, Grand Central Terminal Building, New York.  
Door Hangers, etc. Catalog. 8 x 9½ in. 32 pp.
- Russell & Erwin Mfg. Co.**, New Britain, Conn.  
General Catalog. 9 x 12 in. 1250 pp.  
Russwin Period Design Booklet. 6 x 8 in. 72 pp.  
Russwin Fire Exit Bolt Catalog. 6 x 9 in. 46 pp.  
Russwin Monograph (28 subjects). 3½ x 6 in. 6 pp.
- Stanley Works, The**, New Britain, Conn.  
Wrought Hardware. Catalog. Describing wrought steel hinges, butts and door bolts. 6½ x 10 in. 260 pp.  
Stanley's Wrought Steel Garage Door Hardware. Booklet. 3½ x 6¼ in. 8 pp.  
Properly Hung Doors. Booklet. 5 x 7½ in. 16 pp.  
"Stanley" Sherardizing. Descriptive booklet. 3½ x 6¼ in. 4 pp.
- Vonnegut Hardware Company**, Indianapolis.  
Von Duprin Self-Releasing Fire Exit Device. Catalog 12F.

## HEATING EQUIPMENT

- American Blower Co.**, Detroit, Mich.  
"A B C" Heaters. Bulletin. 8½ x 11 in. 24 pp.  
Vento Cast-Iron Hot-Blast Heater. Bulletin. 8½ x 11 in. 44 pp.
- American Radiator Co.**, 816 S. Michigan Avenue, Chicago.  
The Ideal Fitter. Handbook with specification data. 6½ x 3¾ in. 336 pp.
- Boynton Furnace Co., The**, 106 West 37th Street, New York.  
Square Pot Heaters. Catalog. 7 x 9¼ in. 60 pp.
- Crane Co.**, 836 South Michigan Avenue, Chicago.  
Steam Goods. Complete pocket catalog. 4½ x 6 in. 620 pp.
- Fulton Company, The**, Knoxville, Tenn.  
Catalog D. 7 x 10½ in. 22 pp.  
The Ja-Nar'. Catalog. Color plates and specification data. 8½ x 11 in. 20 pp.
- Gorton & Lidgerwood Co.**, 96 Liberty Street, New York.  
Modern House Heating. Catalog No. 88. 4¼ x 7 in. 32 pp.
- Jenkins Bros.**, 80 White Street, New York.  
Catalog and Price List. 4 x 6½ in. 256 pp.
- Kelsey Heating Co., The**, 238 James Street, Syracuse, N. Y.  
Architects' Portfolio. 12 plates showing plans, heating, specifications, and layouts. 8½ x 11 in.  
Kelsey System of Heating and Ventilating. Booklet. 36 pp.  
Kelsey Warm Air Generators. Booklet. 32 pp.
- Lord & Burnham Co.**, 42d Street Building, New York.  
Burnham Boilers. Catalog No. 56. 4 x 10 in. 19 pp.
- Sturtevant Co., B. F.**, Dept. B, Hyde Park, Boston, Mass.  
Heating and Ventilation. Treatise. 6½ x 9 in. 325 pp.  
Heating and Ventilating Layouts. Blue print book. Bulletin No. 227. 8½ x 11 in. 28 pp.  
Sturtevant Heaters. A book for architects. 8½ x 11 in. 32 pp.
- United States Radiator Corporation**, Detroit.  
A Modern "House Warming." Booklet. 6 x 9 in. 30 pp.  
The "Complete Line." Technical data. Catalog. 4¼ x 7¼ in. 270 pp.

## HOISTS

- Gillis & Geoghegan**, 544 West Broadway, New York.  
The G. & G. Telescopic Hoist (all models). Booklet A. 8½ x 11 in. 16 pp.

## HOLLOW TILE — See Tile, Hollow

## INSULATION

- Armstrong Cork & Insulation Co.**, 132 24th Street, Pittsburgh.  
Nonpareil Corkboard Insulation. Scientific treatise. 6 x 9 in. 130 pp.  
Nonpareil High Pressure Covering. Scientific treatise. 6 x 9 in. 84 pp.
- Cabot, Inc., Samuel**, 141 Milk Street, Boston.  
"Service Sheets." Details of Construction and Methods of Using Cabot's Quilt. 16½ x 21½ in.
- Johns-Manville Co., H. W.**, Madison Avenue, New York.  
J-M Keystone Hair Insulator. Booklet. 6 x 9 in. 16 pp.  
How to Reduce Coal Bills 25 Per Cent. (J-M Asbestocel Pipe Covering.) Booklet. 3½ x 6 in. 8 pp.

## JOISTS AND STUDS, PRESSED STEEL

- Berger Manufacturing Co.**, Canton Ohio.  
Metal Lumber. Series of technical bulletins 12F especially prepared for architects. 8½ x 11 in. 32 pp.  
Riblex, Bulletin No. 14. 8½ x 11 in. 4 pp.
- Trussed Concrete Steel Co.**, Dept. B-57, Youngstown, Ohio.  
Kahn Pressed Steel Construction. Catalog. Complete details and specifications. 8½ x 11 in. 32 pp.

## LATH, METAL

- Berger Manufacturing Co.**, Canton, Ohio.  
Berger's Expanded Metal Lath. Booklet. 3½ x 6 in. 44 pp.  
Supplement. 24 pp.

## LATH, METAL — Continued

- General Fireproofing Co., The**, Youngstown, Ohio.  
Herringbone Rigid Metal Lath. A complete catalog on Herringbone Metal Lath. 6 x 9 in. 32 pp.
- North Western Expanded Metal Co.**, 934 Old Colony Building Chicago, Ill.  
Kno-Burn Expanded Metal Lath. Treatise on metal lath, with details and specifications. 6 x 9 in. 52 pp.  
"Chanelath" Handbook. Treatise on ribbed metal lath details and specifications of its application to reinforced concrete construction and for plastering. 6 x 9 in. 64 pp.
- Trussed Concrete Steel Co.**, Dept. B-57, Youngstown, Ohio.  
Hy-Rib Handbook. Specifications. 5½ x 7¼ in. 142 pp.
- Wright Wire Co.**, Worcester, Mass.  
General Catalog. Description and full particulars of wire lath, wire fencing, ornamental iron work, elevator cabs, railings, partitions, and grille work. 6 x 9 in. 224 pp.  
Wire Lath. Booklet L. Shows where Wright wire lath has been used. 3½ x 6½ in. 16 pp.

## LIGHTING EQUIPMENT

- Ivanhoe-Regent Works of General Electric Co.**, Cleveland.  
Lighting Handbook. Semi-technical on general lighting practice. 4 x 7 in. 94 pp.  
Semi-Indirect Lighting Bowls. Catalog No. 108. 8 x 10½ in. 48 pp.  
Holophane Reflectors and Fittings. Catalog No. 80. 4 x 7 in. 50 pp.  
Ivanhoe Reflectors and Fittings. Catalog No. 303. 4 x 7 in. 50 pp.
- Luminous Unit Co.**, St. Louis.  
Brascolite — The Modern Semi-Indirect Lighting System. Catalog No. 5. 8¼ x 10¼ in. 24 pp.  
Brascolite Data. Scientific data sheets. Portfolio 9 x 11½ in. Blue prints.  
Aglites. Folder catalog. All-glass lighting fixtures. 5¼ x 8 in. 8 pp.
- McFaddin & Co., H. G.**, 42 Warren Street, New York.  
Emeralite. Booklet. Colored plates. 3½ x 6¼ in. 32 pp.
- National X-Ray Reflector Co.**, 243 West Jackson Boulevard, Chicago.  
Engineering Data Book. Technical handbook. 6 x 9 in. 125 pp.  
Illumination from Concealed Sources — How to Plan and Specify Indirect Lighting. Scientific treatise. 12 x 15 in. 52 pp. 36 detail drawings.
- St. Louis Brass Mfg. Co.**, St. Louis.  
"Concealite" Catalog A. Lighting fixtures for auditoriums, banks, show windows, etc., from concealed or semi-concealed sources. 7½ x 10½ in. 20 pp.

## METAL LATH — See Lath, Metal.

## METAL TRIM — See Doors, Windows, and Trim, Metal.

## METAL WORK, ORNAMENTAL

- Gorham Co. Architectural Bronze, The**, Fifth Avenue and 36th Street, New York.  
Architectural Mouldings and Rosettes. Catalog. 9¼ x 12½ in. 16 plates.  
"Service Sheets." 16½ x 21½ in.
- Polachek Bronze and Iron Co., John**, 480-494 Hancock Street, Long Island City, N. Y.  
Distinctive Metal Work. Booklet. 8½ x 11 in. 6 pp.
- Smyser-Royer Company**, 1225 Race Street, Philadelphia, Pa.  
Portfolio illustrating standards and other exterior lighting fixtures. 4½ x 10½ in. 175 pp. thus far.
- Tuttle & Bailey Mfg. Co.**, 52 Vanderbilt Avenue, New York.  
Special Designs of Grilles and Screens in Bronze, Brass, Iron, and Steel. Catalog No. 66A. 6½ x 10 in. 40 pp.
- Winslow Bros. Company**, 4600-4700 West Harrison Street, Chicago, P. O. Box No. 803.  
Ornamental Iron and Bronze. Illustrations of completed work. 8½ x 11 in. 300 pp.

## OFFICE SUPPLIES, ARCHITECTS'

- Dixon Crucible Co., Joseph**, Dept. 224-J, Jersey City, N. J.  
"Eldorado" — The Master Drawing Pencil. Booklet.

## ORNAMENTS, PLASTIC

- Jacobson & Company**, 241 East 44th Street, New York.  
Architectural and Decorative Ornaments. Catalog. 9¼ x 12½ in. 192 pp.

## PAINTS, VARNISHES, AND WOOD FINISHES

- Berry Bros.**, Detroit, Mich.  
Natural Woods and How to Finish Them. Complete varnish specifications. 4¼ x 6½ in. 94 pp.  
Luxeberry Cement Coating. Color card. 3½ x 8½ in. 3 pp.



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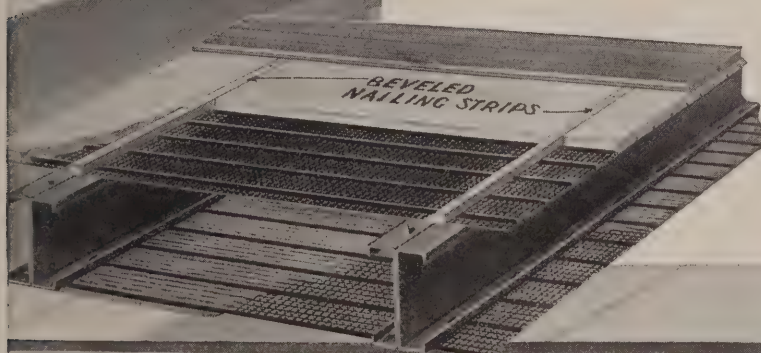
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# SELECTED LIST OF MANUFACTURERS' PUBLICATIONS—Continued from page 26

## PAINTS, VARNISHES, AND WOOD FINISHES—Continued

- Boston Varnish Co.,** Everett Station, Boston.  
Kyanize Enamel. Specifications. Booklet. 5 x 7 in. 20 pp.  
Kyanize White Enamel. Directions. Circular. 3½ x 6 in. 8 pp.  
Price List of Varnishes and Enamels. 3½ x 6 in. 24 pp.
- Dixon Crucible Co., Joseph,** Dept. 224-J, Jersey City, N. J.  
Philosophy of Protective Paint. 3¼ x 6¼ in. 24 pp.
- Lowe Bros. Co., The,** 101 Park Ave., New York and Dayton.  
Architects' Mellotone Handbook. 3 x 8 in. 27 pp. Color plates.  
High Standard Paint and Varnish Specifications. Handbook. 4¼ x 7 in. 70 pp.  
Paint and Painting. Directions and data. 5 x 9 in. 30 pp.  
Varnish and Varnishing. Treatise. 5 x 9 in. 44 pp.
- Murphy Varnish Co.,** Newark, N. J.  
The House that Found Itself. Booklet. 6¼ x 9¼ in. 28 pp.  
Harmony in Interior Decoration. Booklet. 5¼ x 8¾ in. 56 pp.  
Dealer's Descriptive List. Booklet. 4½ x 6¼ in. 28 pp.  
Beautiful Boats and How to Care for Them. Booklet. 5¼ x 8¼ in. 50 pp.
- O'Brien Varnish Company, The,** 39 Washington Street, South Bend, Ind.  
Specification Data. Information concerning O'Brien line of varnishes and interior finishes. 8½ x 11 in.
- Smith & Co., Edward,** P. O. Box 1780, New York.  
Architects' Handbook. Specifications. 5 x 7½ in. 24 pp.
- Toch Brothers,** Dept. 97, 320 Fifth Avenue, New York.  
Specifications for Damp-proofing, Waterproofing, Enameling, and Technical Painting. 8¼ x 11½ in. 48 pp.  
Toch Brothers Preservative Paints and Compounds. Booklet. 5½ x 8¼ in. 36 pp.
- Wadsworth, Howland Co., Inc.,** 139 Federal Street, Boston.  
Bay State Finishes, Stains, and Varnishes. Catalog No. 10. Color cards.

## PARTITIONS, FOLDING AND ROLLING

- Folding Partition Co., Inc.,** 200 Broadway, New York, N. Y.  
Sectionfold Partitions. Catalog with detail sheet. 20 x 27 in.

## PILES

- MacArthur Concrete Pile and Foundation Co.,** 120 Broadway, New York.  
The Pedestal Pile. Catalog. Engineering data. 6 x 9 in. 64 pp.
- Raymond Concrete Pile Co.,** 140 Cedar Street, New York.  
Raymond Concrete Piles. Catalog. 8½ x 11¼ in. 56 pp.

## PIPE

- Byers Company, A. M.,** 235 Water Street, Pittsburgh.  
Bulletin No. 26. Tables and Specifications. Bulletin (2d Edition, Enlarged and Revised). 8½ x 11 in. 24 pp.  
Bulletin No. 27. The Experience of Practical Men. 8½ x 11 in. 40 pp.  
Selection of Pipe for Modern Buildings. Booklet of special interest to architects. 4 x 6 in.  
On the Trail of Byers Pipe. Booklet. 4 x 6¼ in. 46 pp.
- Central Foundry Company,** 90 West Street, New York.  
Soil Pipe and Fittings. Catalog. 4 x 7½ in. 88 pp.  
The Lynn Drain Trap. A leaflet containing description.  
Combination Vent, Revent, and Drainage Fittings. Catalog. 4¼ x 6¼ in. 183 pp.
- National Tube Company,** Frick Building, Pittsburgh, Pa.  
Shelby Mechanical Tubing. Booklet. 3½ x 6 in. 35 pp.  
Boiler Tubes List No. 6, 1916. Booklet. 4 x 6½ in. 16 pp.  
Pipe List No. 5, 1913. Booklet. 4 x 6½ in. 20 pp.  
National Bulletins, Nos. 1 to 27, inclusive. 8½ x 11 in.  
National Pipe Standards. Booklet. Appendix to 1913 edition. Tables and useful information pertaining to tubular goods. 4 x 6½ in. 400 pp.

## PLASTER

- Hydrated Lime Bureau of the National Lime Manufacturers' Association,** 1506 Arrott Bldg., Pittsburgh.  
Standard Specifications for Hydrated Lime Plastering. Pamphlet E. 6¼ x 9¼ in. 20 pp.  
Better Plastering and Better Acoustics. Bound booklet. 6¼ x 9¼ in. 40 pp.  
Better Methods in Concrete Construction. Bulletin No. A-5. Treatise on the use of hydrated lime in concrete. 6 x 8 in. 16 pp.
- Kelley Island Lime & Transport Co.,** Cleveland, Ohio.  
Specifications for Hydrated Lime Plastering. Booklet. 6 x 9 in. 20 pp.  
Hydrated Lime Plaster. Booklet. 6¼ x 9¼ in. 12 pp.  
Tiger Tales. Booklet. 4 x 8 in. 12 pp.  
The Perfect Finishing Lime. Booklet. 4½ x 7¼ in. 34 pp.

## PLUMBING EQUIPMENT

- Crane Co.,** 836 South Michigan Avenue, Chicago.  
Catalog. 9 x 12 in. 834 pp.
- Kohler Co.,** Kohler, Wis.  
Kohler Catalog. Cloth bound. 9½ x 11¼ in. 164 pp.
- Standard Sanitary Mfg. Co.,** Dept. 4, Pittsburgh, Pa.  
"Standard" Catalog. General catalog of "Standard" line. 9 x 12 in. 676 pp.  
"Standard" Plumbing Fixtures for the Home. Catalog.  
Factory Sanitation. Catalog and scientific treatise. 9 x 12 in. 36 pp.

## PLUMBING EQUIPMENT—Continued

- Trenton Potteries Co.,** Trenton, N. J.  
Bathrooms of Character. Booklet. 4 x 7¼ in. 48 pp.  
Sanitary Pottery. Monthly house organ. 6 x 9 in. 16 pp. Color plates.

## POTTERY, GARDEN

- Atlantic Terra Cotta Company,** 1170 Broadway, New York.  
Garden Pottery. Catalog. 9 x 12 in. 12 pp.

## PUMPS

- Goulds Manufacturing Co.,** Seneca Falls, N. Y.  
All Types of Centrifugal and Reciprocating Power Pumps.  
Bulletins. 20 sections. 7¼ x 10 in.  
Handy Data on Power Pumping. Bulletin 118. 7¼ x 10 in. 24 pp.

## ROOFING

- American Sheet & Tin Plate Co.,** Frick Building, Pittsburgh.  
Copper—Its Effect Upon Steel for Roofing Tin. Scientific treatise. New edition. 8½ x 11 in. 24 pp.  
Pocket Reference Book. 2½ x 4¼ in. 168 pp.
- Barrett Company, The** (formerly The Barrett Mfg. Company), 17 Battery Place, New York City.  
Barrett's Specification Roofs—20-Year Guaranty Bond. Loose-leaf specifications with details. 8½ x 14 in.  
Foundation Waterproofing. Loose-leaf specifications. 8½ x 14 in.  
Tylkie Shingles with Red or Green Crushed Slate Surface. For residences, etc. Descriptive booklet. 6 x 8 in.  
Velvex Creosote Shingle Stains. Descriptive folder showing colors on wood. 3½ x 6½ in.
- Boyle & Co., Inc., John,** 112-114 Duane Street, New York.  
Opinions of Practical Builders. Instructions for using Bayonne Roof and Deck Cloth. Book S. 3½ x 6 in. 24 pp.
- Carey Co., The Philip,** Lockland, Cincinnati.  
Architects' Book of Carey Roofing Specifications.
- Creo-Dipt Co.,** 1025 Oliver Street, North Tonawanda, N. Y.  
"Service Sheet" 1, No. 28. Working Drawings of Construction of "Thatch" Roof. Standard specifications and instructions for design and construction of same. 16½ x 21½ in.
- General Slate Company,** 200 Devonshire Street, Boston.  
General Slate Company—Roofing Slate. Booklet. 6 x 9 in. 16 pp.
- Johns-Manville Co., H. W.,** Madison Avenue, New York.  
J-M Corrugated Asbestos Roofing. Catalog. 6 x 9 in. 32 pp.  
J-M Transite Asbestos Shingles. Catalog. 6 x 9 in. 32 pp.
- Ludowici-Celadon Company,** 104 South Michigan Avenue, Chicago.  
Roofing Tile. A detailed reference for architects. 9¼ x 13½ in. 106 pp.  
Roofing Tile Catalog. 3¼ x 9 in. 10 pp.  
The Roof Beautiful. Booklet. 6¼ x 9¼ in. 40 pp. Color plates.  
Why Tile Is Best. Booklet. 3¼ x 6¼ in. 8 pp.
- Taylor Co., N. & G.,** 300 Chestnut Street, Philadelphia.  
A Guide to Good Roofs. Booklet. 3¼ x 5½ in. 24 pp.  
Selling Arguments for Tin Roofing. Booklet. 6 x 9¼ in. 80 pp.  
"Service Sheets." Working drawings showing details of construction of heavy ribbed and standing seam tin roofing; also color suggestions for tin roofs and tables of covering capacity of tin. 16½ x 21½ in.  
Standard Specifications for Tin Roofing Work. 7½ x 9 in.

## STONE

- Indiana Limestone Quarrymen's Association,** P. O. Box 505, Bedford, Ind.  
Indiana Limestone Booklet. Vol. I. 6 x 8¼ in. 40 pp.

## STORE FRONTS

- Detroit Show Case Co.,** 467 Fort Street West, Detroit, Mich.  
Metal Store Front Construction. Handbook. 6 x 10 in. 32 pp.  
With full size blue print details. 24 x 36 in.
- Kawneer Manufacturing Co.,** Niles, Mich.  
Architects' Portfolio of Details. 17 full size construction plates, loose leaf. 34 x 44 in. Also 17 half size construction plates, bound. 8½ x 11 in.
- Zouri Drawn Metals Co.,** 1817 East End Avenue, Chicago Heights, Ill.  
Zouri Safety Key-Set Store Front Construction. Detail sheet showing sections of construction. 9 x 11 in. 4 pp.

## STUCCO BOARD

- Bishopric Manufacturing Co., The,** 910 Este Avenue, Cincinnati, Ohio.  
The Bishopric Mastic Products. Booklet. 6 x 9½ in. 24 pp. Color plates.  
Built on the Wisdom of Ages. Booklet showing methods of using Bishopric Stucco Board. 8½ x 11 in. 48 pp.  
"Service Sheets." 16½ x 21½ in.

## TELEPHONE SYSTEMS, INTERIOR

- Western Electric Co.,** 195 Broadway, New York.  
Western Electric Interphone Specifications. Handbook. 8¼ x 11 in. 41 pp.



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SELECTED LIST OF MANUFACTURERS' PUBLICATIONS — *Continued from page 28***TERRA COTTA, ARCHITECTURAL**

- American Terra Cotta & Ceramic Co.**, 2010 Peoples' Gas Building, Chicago.  
Specifications for Architectural Terra Cotta and Details of Construction. 14 plates.
- Atlantic Terra Cotta Co.**, 1170 Broadway, New York.  
Atlantic Terra Cotta. Monthly publication. 9 x 12 in. 12 pp.
- Conkling-Armstrong Terra Cotta Co.**, Philadelphia.  
Ornament and Details of Construction. Catalog. 9½ x 13 in.
- Midland Terra Cotta Co.**, 1515 Lumber Exchange Building, Chicago.  
Stock Terra Cotta. Portfolio. 10 x 15 in. 60 plates.
- New Jersey Terra Cotta Co.**, Singer Building, New York.  
The Victoria Building. Booklet. 8½ x 11 in. 10 pp.
- New York Architectural Terra-Cotta Co.**, 401 Vernon Avenue, Long Island City, N. Y.  
Architectural Terra Cotta. Booklet. 8 x 8½ in. 36 pp.
- Northwestern Terra Cotta Co., The**, 2525 Clybourn Avenue, Chicago.  
Architectural Terra Cotta. Booklet. Showing illustrations of buildings and details. 8½ x 11 in. 60 pp.
- South Amboy Terra Cotta Co.**, 150 Nassau Street, New York.  
Plates of Ornamental Detail and Construction. Portfolio.

**TILE, HOLLOW**

- National Fire Proofing Co.**, 596 Federal Street, Pittsburgh.  
Builders' Handbook. Details of construction. 8½ x 11 in. 34 pp. Blue prints.  
Fireproof Houses of Natco Hollow Tile. Catalog. 8½ x 11 in. 30 pp.  
Long Span Fireproof Floor Construction. Details, tables, tests. Handbook. 8½ x 11 in. 60 pp. Color plates.  
Natco on the Farm. Catalog. 5½ x 7½ in. 50 pp.

**TILE, STEEL**

- General Fireproofing Co., The**, Youngstown, Ohio.  
Steel-Tile Handbook. Tables, formulas, specifications, etc., for tile floors and concrete work. 6 x 9 in. 32 pp.
- Trussed Concrete Steel Co.**, Dept. B-57, Youngstown, Ohio.  
Florestyle Construction. Booklet containing table and full information for specifying. 8½ x 11 in. 16 pp.

**UPHOLSTERY FABRICS**

- Chase & Co., L. C.**, 89 Franklin Street, Boston.  
Chase Mohair Velvets. Booklet. Description of fabrics with color reproductions. 9½ x 12½ in. 10 pp.  
Chase Leatherwove. Folder. Descriptive of material and its uses. 3½ x 6½ in.

**VACUUM CLEANERS**

- Sturtevant Co., B. F.**, Dept. B., Hyde Park, Boston.  
Sturtevant Vacuum Cleaners. Handbook for architects. No. 248. 8½ x 11 in. 36 pp.
- Western Electric Co.**, 195 Broadway, New York.  
Western Electric Vacuum Cleaner. Specifications. Bulletin. 8½ x 11 in. 62 pp.

**VENETIAN BLINDS**

- Wilson Corporation, The, J. G.**, 8 West 40th Street, New York.  
The Lighting and Ventilation of Modern Buildings. Treatise with working drawings. 8½ x 11 in. 12 pp.

**VENTILATION**

- American Blower Co.**, Detroit, Mich.  
American Sirocco Fans and Blowers. Bulletin. 8½ x 11 in. 52 pp.
- American Radiator Co.**, 816 So. Michigan Avenue, Chicago.  
"A B C" Steel Plate Fans. Bulletin. 8½ x 11 in. 28 pp. Ventilation by Vento Heaters. Booklet. 8 x 10½ in. 24 pp.
- Clarage Fan Co.**, Kalamazoo, Mich.  
Catalog No. 5. 6 x 9 in. 26 pp.
- Globe Ventilator Co.**, Dept. P, Troy, N. Y.  
Booklet. 4 x 9 in. 36 pp.
- Ohio Blower Co., The**, 5119 Perkins Avenue, Cleveland.  
Gospel of Fresh Air. Booklet. 4 x 9 in. 24 pp.
- Sturtevant Co., B. F.**, Dept. B, Hyde Park, Boston.  
Sturtevant Heaters. Catalog, containing data, curves, tables, and complete layouts for the use of architects in specifying heating and ventilating systems. 8½ x 11 in. 132 pp.  
Auto Force Ventilators. Bulletin No. 232. 8½ x 11 in. 12 pp.

**WALL BOARD**

- Carey Co., The Philip**, Lockland, Cincinnati.  
Carey "Ceil-board" for Walls and Ceilings. Specifications. 8 x 11 in. 2 pp.

**WALL COVERINGS**

- Standard Oil Cloth Company, Inc., The.**, Dept. I, 320 Broadway, New York.  
Sanitas Modern Wall Covering. Booklet. 5 x 7 in. 28 pp. Color plates.  
Hints to Decorators. Booklet. 5 x 7 in. 12 pp. Colored inserts.  
What They Say About Sanitas. Booklet. 5 x 7 in. 27 pp.  
Selling Helps. Booklet. 5 x 7 in. 24 pp.

**WATERPROOFING**

- Anti-Hydro Waterproofing Co.**, 9 Orchard Street, Newark, N. J. (Singer Building, N. Y. C.)  
Concrete Hardener Waterproofing. Booklet. 6½ x 8½ in. 8 pp.

**WATERPROOFING — Continued**

- General Fireproofing Co., The**, Youngstown, Ohio.  
Waterproofing Handbook. 6 x 9 in. 88 pp.
- Sandusky Cement Co., The**, Dept. S, Engineers' Building, Cleveland, Ohio.  
Medusa Waterproofing. Booklet. 7 x 9 in. 36 pp.
- Sonneborn Sons, Inc., L.**, Dept. 4, 264 Pearl St., New York.  
Concrete and Lapidolith. Treatise on concrete construction and the use of Lapidolith with it. 5½ x 8½ in. 20 pp.
- Trus-Con Laboratories, The**, 1246 Trus-Con Building, Detroit, Mich.  
Architects' Handbook. 8½ x 11 in. 36 pp.  
Structural Waterproofing. 8½ x 11 in. 52 pp.  
Agatex Book. 5½ x 8 in. 18 pp.  
Descriptive Price List. 3½ x 6½ in. 24 pp.
- Wadsworth, Howland Co., Inc.**, 139 Federal Street, Boston.  
Bay State Brick and Cement Coating. Booklet No. 10. Color plates.

**WATER SYSTEMS**

- Armstrong Cork & Insulation Co.**, 132 24th St., Pittsburgh.  
Drinking Water Systems. Treatise. 6 x 9 in. 48 pp.

**WINDMILLS**

- Corcoran, Inc., A. J.**, 763 Jersey Avenue, Jersey City, N. J.  
Windmills. Booklet.

**WINDOWS, CASEMENT**

- Crittall Casement Window Co.**, Detroit, Mich.  
Universal Casements. Catalog No. 15, showing solid steel casement windows. Details. 9½ x 12 in. 64 pp.
- Hope & Sons, Henry**, 103 Park Avenue, New York.  
Casement Windows. Details and sections. Catalog. 10 x 15 in. 187 pp.
- International Casement Co., Inc.**, Jamestown, N. Y.  
Casement Windows and Leaded Glass. Catalog. 10 x 14 in. 56 pp. Plates showing 16th century Tudor residences.

**WIRE FENCES**

- Wright Wire Company**, Worcester, Mass.  
Excelsior Rust Proof Fencing. Illustrated and descriptive booklet. 3½ x 6 in. 16 pp.

**WOOD**

- Arkansas Soft Pine Bureau**, 725 Bank of Commerce Building, Little Rock, Ark.  
Architects' Manual. Handbook with grading rules, finishing and painting specifications, and standard moulding designs. 8½ x 11 in. 62 pp.  
"Arkansas Soft Pine—How to Finish and Paint It." Descriptive of wood. Finishing specifications for interior and exterior use. 6½ x 8½ in. 26 pp.  
Not a House but a Home. Home construction hints for the layman. Description of wood. Cottage and residence designs, with introduction by Aymar Embury II, architect. 9 x 12 in. 36 pp.
- Gum Lumber Manufacturers' Association**, 1304 Bank of Commerce Building, Memphis, Tenn.  
Red Gum Facts. Catalog. 5½ x 8½ in. 20 pp.  
Technical Information about Red Gum. Catalog. 5½ x 9 in. 20 pp.
- North Carolina Pine Association**, 83 Bank of Commerce Building, Norfolk, Va.  
Architects' Reference Book. Booklet. 8½ x 11 in. 16 pp. Color plates.  
Home Builders' Book. 5 x 9 in. 24 pp. Color plates.
- Northern Hemlock and Hardwood Mfr's Assn.**, 205 F. R. A. Building, Oshkosh, Wis.  
Birch Interiors. Booklet. 9½ x 12 in. 46 pp.  
Beautiful Birch for Beautiful Woodwork. Leaflet. 8½ x 11½ in. Serviceability and Qualities of Birch. Booklet. 8½ x 11 in. 7 pp.  
Rules for the Inspection of Hemlock Lumber. Booklet. 3½ x 6½ in. 32 pp.
- Southern Cypress Manufacturers' Association**, 1234 Hibernia Bank Building, New Orleans.  
Cypress Pocket Library. Covers all uses for cypress. 41 units. 3¼ x 5½ in.
- Southern Pine Association**, Dept. M-52, Interstate Bank Building, New Orleans, La.  
Rules for Grading Southern Yellow Pine Timbers. Treatise. 3½ x 6 in. 24 pp.  
Creosoted Wood Block Floors. Booklet. 7 x 10 in. 32 pp.  
Directions for Furnishing Southern Yellow Pine. Technical booklet. 7 x 10 in. 20 pp.  
Manual of Standard Wood Construction. Scientific handbook. 4½ x 6½ in. 150 pp.
- White Pine Bureau**, 1930 Merchants Bank Building, St. Paul, Minn.  
Specification Book—Classified Recommended Uses for White Pine. Illustrating the various standard grades and indicating their proper uses. 8½ x 11 in. 196 pp.  
Three Story Houses of New England. Architectural monograph, Vol. III, No. 1. 8½ x 11 in. 16 pp.  
Early Wooden Architecture of Andover, Mass. Monograph. Vol. III, No. 2. 8½ x 11 in. 16 pp.  
Old Houses of Newburyport, Mass. Monograph. Vol. III, No. 3. 8½ x 11 in. 16 pp.



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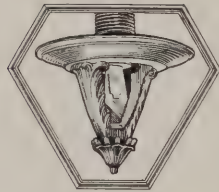
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SAN ANTONIO.....212 LOSOYA  
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Keas & Colburn, Architects  
Grant Construction Co., Contractors



## Designed for Permanence

The concrete work in this large new factory is practically ever lasting. Water, the chief cause of decay and disintegration of concrete, can do no damage for all concrete has been waterproofed with

# TRUS-CON *Waterproofing Paste* CONCENTRATED

This is another of the thousands of cases where Trus-Con Waterproofing Paste is insuring buildings and merchandise against water damage of all kinds.

*A handsomely illustrated book, "Structural Waterproofing," giving full information upon Waterproofing Paste, will be sent free on request written on business stationery*

**The Trus-Con Laboratories**  
*Manufacturers and Inventors of*  
Waterproofings, Dampproofings, Technical Coatings and Floor Hardeners  
1246 Trus-Con Building Detroit, Michigan







SHOE FACTORY, WM. H. WALKER & CO., BUFFALO, N. Y.  
TURNER CONSTRUCTION COMPANY, CONTRACTORS AND ENGINEERS LEHIGH CEMENT USED

# LEHIGH CEMENT

LEHIGH PORTLAND CEMENT COMPANY  
*Member of the Portland Cement Association*

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## MUNICIPAL PIER, PHILADELPHIA

*Snare & Triest Co., Contractors*

One of Philadelphia's splendid Municipal Piers, designed by the Department of Wharves, Docks and Ferries, and built of concrete made with Pennsylvania Cement. This brand is noted for a remarkable uniformity of high quality and over 90% of the total production is used in construction that calls for the highest tests. Ask your dealer for Pennsylvania Cement. If he cannot supply you, write direct to Pennsylvania Cement Company, 30 East 42nd Street, New York.

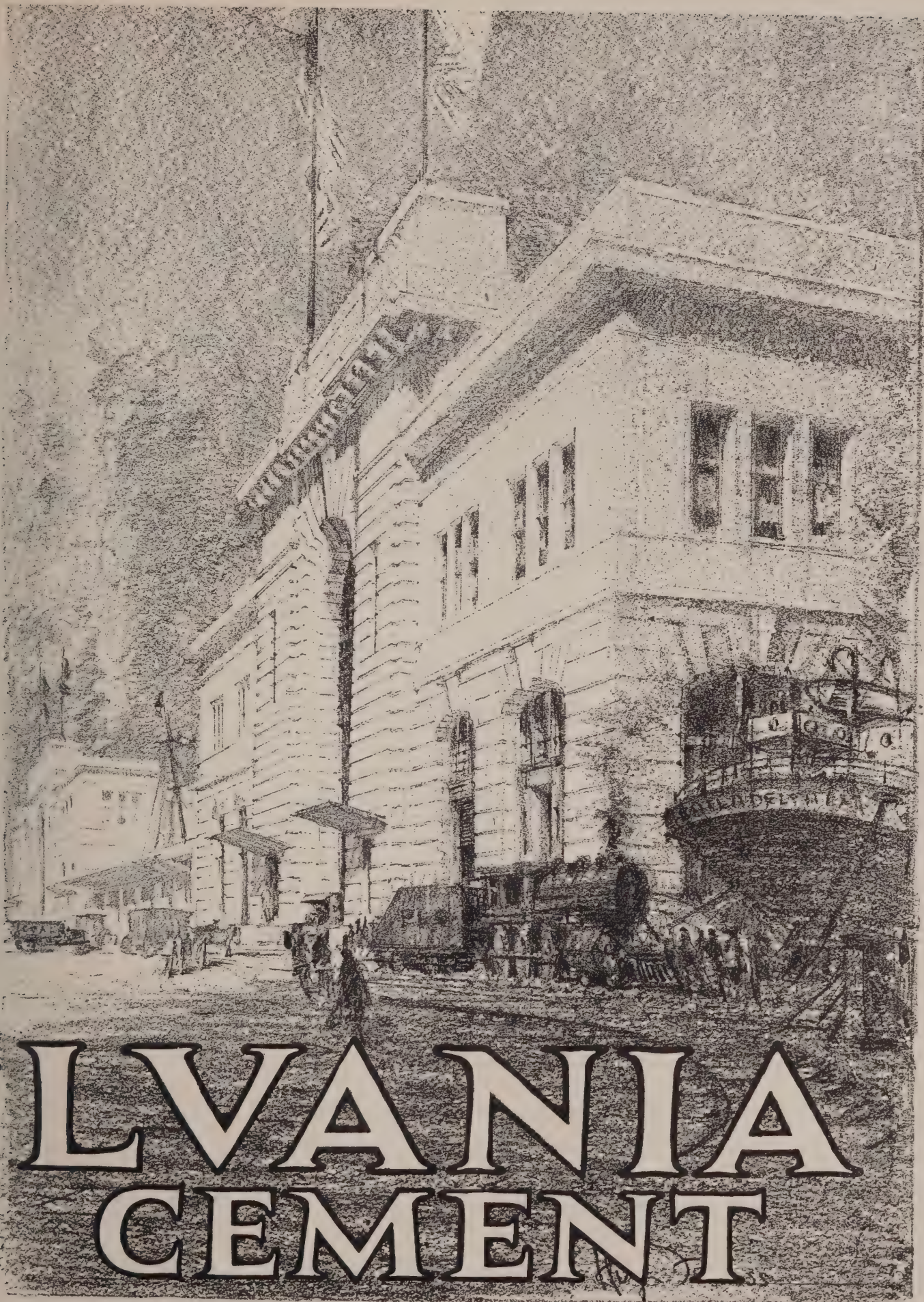
*"One Source — One Mill — One Standard"*

Copyright 1917 P. C. Co.



PENNSY  
PORTLAND









Pickel Realty Co. Building, St. Louis

Preston J. Bradshaw, Architect

*Waterproofed with Medusa Waterproofing*

## Medusa Means Permanence

THE outstanding fact about Medusa Waterproofing is that it has been in use long enough to establish beyond question its claim that it is a permanent waterproofing. It is the original, successful integral waterproofing and as such is entitled to first consideration by the architect.

### MEDUSA WATERPROOFING

PATENTED

PASTE AND POWDER

should be specified for all stucco exteriors; swimming pools and public baths, and for for all decorative cement work such as all concrete which should be moisture and porch columns, balustrade, terrace walls, damp proof. etc.; for concrete foundations as base- Medusa Waterproofing does not affect ment floors, for subways and tunnels in the color, strength or setting of cement railway stations and public buildings; or concrete. Any intelligent workman can for floors in stables and dairy barns; for use it without previous experience.

The illustrated booklet "Medusa Waterproofing" will give you full details about its use. Write for it.

THE SANDUSKY CEMENT CO., Dept. S, Cleveland, O.





General Electric Company, Fort Wayne, Ind. Harris & Richards, Architects  
Structural concrete building faced with brick

INDUSTRY is looming larger and is daily becoming more prosperous. This has already created a greater demand for better buildings—safer, stronger, more permanent, more truly economical, and (this is of especial interest to architects) of better design. Architects are realizing, more and more, the growing opportunities in this field—especially in reinforced concrete industrial buildings, which offer the most practical advantages to the owner, and, at the same time, a new and valuable contribution to architecture. We are glad to furnish architects, on request, statistics and data on reinforced concrete construction; and we will co-operate with them in developing designs and economical layouts. The Atlas Portland Cement Company, New York or Chicago.





## These Self-Sentering Jobs Are Fireproof, Wearproof; Defy Time and Resist Weather

The top illustration suggests the wonderful rigidity of Self-Sentering, which makes it suitable for reinforced concrete roofs, floors, ceilings, partitions, steps, stairs, garages, fences, bridges. The remaining illustrations suggest its pliability and adaptability to all kinds of curved construction.

The roof is that of the Carnegie Steel Company's office building, Youngstown, Ohio. The Self-Sentering acts as form and reinforcing for the concrete.

# Self-Sentering

Form and Reinforcement for Concrete Construction

No matter what kind of roof is desired — pitched, dome, saw-tooth, monitor, or flat—Self-Sentering eliminates the need of temporary wooden forms and the cost of building them up and tearing them down. The heavy steel ribs and the diamond-mesh connecting fabric support the mass of wet concrete and act as permanent bond and reinforcement after the concrete has set.

A sheet of curved Self-Sentering and two water tanks, with the concrete reinforced by that material, also are shown on this page. Self-Sentering can be curved at our factory to any desired radius—12 inches or over. It takes the shape of conduits, culverts, water tanks, curved floors, unusual effects in roof and partition construction, and miscellaneous fireproofing uses such as posts and false columns.

Wherever concrete is used, the use of Self-Sentering results in fireproof, lightweight, money-saving, permanent construction.



Ask for the GF "Fireproofing Handbook," which gives complete information about speedy and economical concrete construction.



**The General Fireproofing Co.**  
Youngstown, Ohio

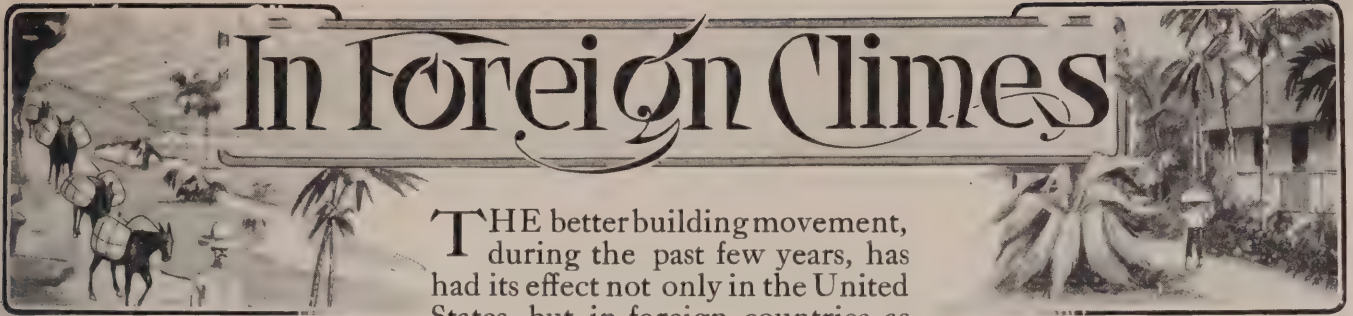
Manufacturers of All Types of Metal Lath,  
Concrete Reinforcements, Waterproofings

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The best dealer in your town has  
GF products in stock





THE better building movement, during the past few years, has had its effect not only in the United States, but in foreign countries as well.

Buildings of various types and sizes in forty states in this country and in eight different foreign countries have been erected with

## Berger's *Metal Lumber*

(Patented)

The U. S. Government, War Department, has used the material extensively, forty-four carloads having been furnished on one order in the construction of the Schofield Barracks at Honolulu.

Berger's Metal Lumber is so flexible in adaptability that it can be used any place, with the same degree of ease as wood joists and studs.

This pressed steel construction gives positive assurance of strength, safety and permanency and the buildings in which it is used never depreciate in value to any extent.

It is proof against fire, rodents, sound and decay; prevents cracks in walls and ceilings; eliminates maintenance expense, and reduces insurance costs.

*Bulletin 12 F contains complete technical information on Berger's Metal Lumber. Send for a copy. Also consult Sweet's, pages 244-250.*

## The Berger Mfg. Company

CANTON, OHIO



Branches: Boston New York Philadelphia Chicago  
St. Louis Minneapolis San Francisco Los Angeles  
Export Dept.: Berger Bldg., New York City, U. S. A.



Government Astronomical Observatory  
Lima, Peru, S. A.



Residence, Caracas, Venezuela, S. A.



Residence, Caracas, Venezuela, S. A.



Occidental Bank, Zacatecoluca, Salvador, C. A.



Hardware Store, Caracas, Venezuela, S. A.



Residence, Caracas, Venezuela, S. A.



Showing part of a group of 44 residences, comprising officers' quarters of the War Department, U. S. Government, Schofield Barracks, at Honolulu, H. I. The floors, roof partitions, stairs, porches and exterior walls throughout were constructed with Berger's Metal Lumber. Finished with stucco on Berger's Expanded Metal Lath



*Used for Years*

# LAPIDOLITH

TRADE MARK

## For All Concrete Floors

### Architects Who Know

how different Lapidolith is from other concrete hardeners — how positive its results — how wide its use — those architects can offer a most profitable service to clients.

Lapidolith is used *after the concrete floor is finished*, because it is a liquid chemical.

*Just flush it on!*

It positively hardens concrete, dustproofing and wearproofing it.

It is recognized as the standard liquid hardener. Thousands of factory and institutional floors have been lapidolized, successfully and permanently.

Investigate Lapidolith. Scientific and practical proof and sample on request.

Department 4

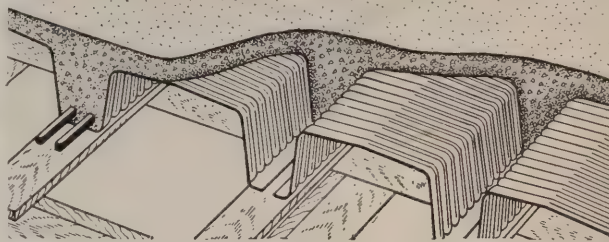
### L. SONNEBORN SONS, INC.

*Manufacturers of Cemcoat  
the Washable Wall Coating*

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*Used for Years*



## Reduce Cost of Floor Construction

**S**OLID concrete floor slabs mean unnecessary dead load and expense. The necessary strength is obtained, time of construction lessened, and the cost greatly reduced by the use of

## BERGER'S PRESSED STEEL CORES

This type of fireproof construction can be installed more rapidly than any other concrete system, as it requires only simple and inexpensive form work.

By eliminating 40 to 60 per cent of the dead weight of the floor slab, great savings are effected not only in concrete but in the use of lighter construction materials throughout.

These cores can be used in either a steel or concrete structural frame building. Practical for use on spans up to 30 feet, without intermediate beams, where loads to be carried are not unusually heavy.

Both permanent and removable cores in a variety of sizes and gauges. Berger's Pressed Steel Cores will enable you to economically design floors of safety and permanency.

*See Sweet's, page 195*

**The Berger Manufacturing Co., Canton, O.**



Branches: Boston New York Philadelphia Chicago  
St. Louis Minneapolis San Francisco  
Export Department: Berger Building, New York City, U. S. A.

## THE WINSLOW WINDOW

(AUSTRAL BALANCE)

**G**IVES free ventilation without direct drafts. Admits 15% to 25% more light than the ordinary double hung sash. Trim, simple and efficient in every way.

SEND FOR LATEST CATALOG

We have the facilities, the experience and the spirit to give architects the quickest and most satisfactory service on all contracts.

If a demonstration of the window is desired, we will send a working model and a representative to show you its many advantages.

## WINSLOW BROS. COMPANY

Main Offices and Works:

4600-4700 W. Harrison Street, Chicago

Mailing Address: P. O. Box No. 803

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Los Angeles

8 W. 40th St. Building  
New York

Ferguson Building  
Pittsburgh

**Scientific Ventilation**



# IS 33 YEARS? A FAIR TEST?



Just 33 years ago the Wallace Memorial Library of Fitchburg, Mass., was built. Wright Wire Lath was used as the plaster support. These walls have never undergone repair and are to-day in a perfect state of preservation. Simply another proof that

## WRIGHT WIRE LATH

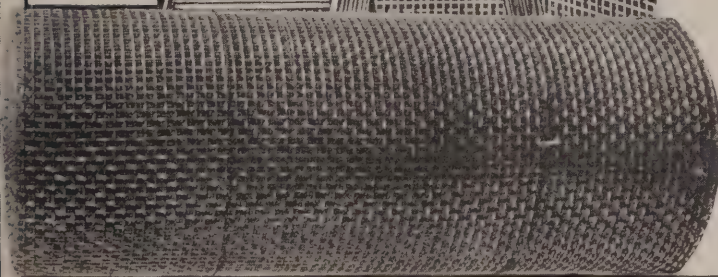
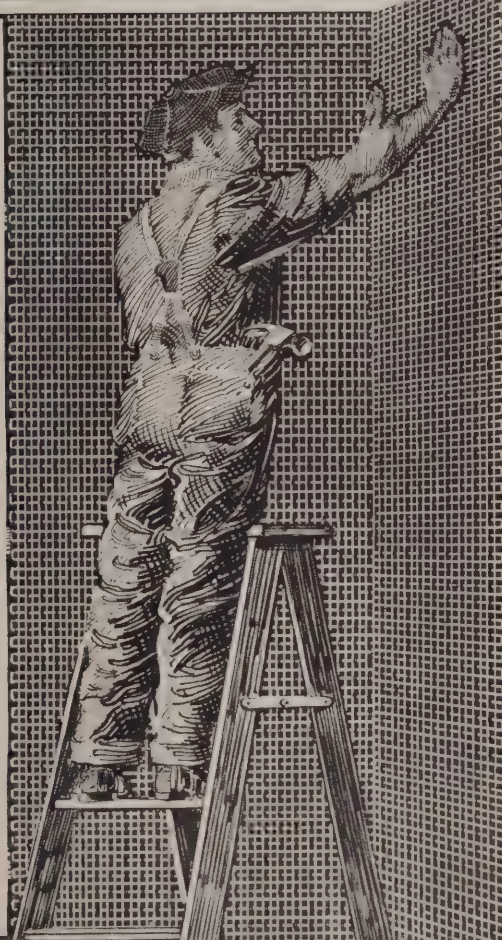
makes permanent walls when properly put up. A generation of service has failed to disturb even to the slightest degree the mural paintings in the art gallery shown above. This is permanency that you may expect—a high mark of perfection after service of a third of a century.

Wright Wire Lath is a woven fabric of cold-drawn steel wires. All the inherent strength of the metal is there. The plaster keys through to the back, completely embedding the lath. Has a strong, even selvage which makes it easily handled and tied together.

*"The lath of the perfect key"*

*For full information concerning WRIGHT WIRE LATH, write for booklet L, architect's service sheet, and ask any questions that occur to you.*

**WRIGHT WIRE CO.**  
WORCESTER, MASS.





# Walls of Hydrated *LIME PLASTER* ABSORB SOUND

A CAREFUL analysis of the reasons for this statement proves its truth. Porous wall surfaces absorb sound, whereas dense non-porous walls reflect sound-waves, causing reverberation and echo—bad acoustics. HYDRATED LIME PLASTER is porous *in its hardened state* because the mixing-water necessary in its application is entirely given off afterwards, with the result that all space containing mixing-water is converted into microscopic pores—invisible to the naked eye but always there to do their work in breaking up sound-waves and in improving the acoustical qualities of the room.

Churches, and indeed all auditoriums, should not only be planned with reference to the best modern acoustical practice, but the wall surfaces should be of such material that any minor acoustical flaws which might otherwise develop will be corrected and the whole acoustical result be enriched and insured.

Such a material is HYDRATED LIME PLASTER when used for scratch and brown coats.



Council Chamber, New City Hall, Cleveland, Ohio  
J. Milton Dyer, Architect  
Hydrated Lime Plaster Used on Walls

Send for the bulletin "Auditorium Acoustics," which gives much of value on this most important subject

## HYDRATED LIME BUREAU

of the National Lime Manufacturers' Association

1506 ARROTT BUILDING

Pittsburgh - - - Pa.



McKinley Memorial, Canton, Ohio  
No. 110 "R. I. W." used as a backing on limestone for damp-proofing and stainproofing

## ITS BEAUTY WILL ENDURE

The architect's work only begins when a structure is complete. For the structure itself is his work. It is not enough to build beautifully—it is necessary to build for all time.

## No. 110 *R.I.W.* REMEMBER IT'S WATERPROOF DAMP-RESISTING PAINT

The beauty of the McKinley Memorial at Canton, Ohio, is enduring beauty. The limestone will not disintegrate. It will not suffer unsightly stains. Liberal backing coats of 110 "R. I. W." were used to prevent moisture from eating into it and stains from marring its surface.

Detailed literature about "R. I. W." Protective Products will be sent upon request.

## TOCH BROTHERS

Technical and Scientific Paint Makers Since 1848

320 Fifth Avenue, New York City

Works: New York; London, Eng.; Toronto, Canada

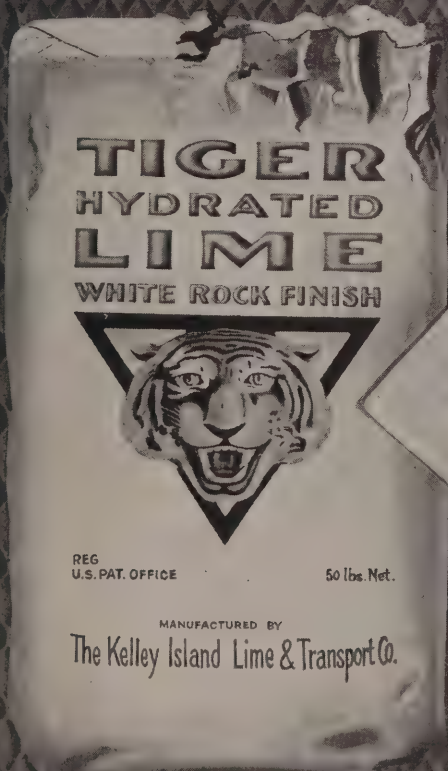
**REMEMBER IT'S WATERPROOF**  
**R.I.W.**  
REG. U.S. PAT. OFF.

**STEEL NEED NOT RUST!**  
**WOOD NEED NOT ROT!**  
**NOR CONCRETE DUST!**



# TIGER LIME

## COVERS WELL



Tiger Lime makes an easy working putty, which spreads like butter, under the trowel.

It does not "roll up" or "work short," and therefore a small quantity will cover a large amount of wall surface.

The  
Kelley Island Lime  
& Transport Co.

Cleveland, Ohio





## Meeting Architects' Needs

Practice has established certain definite requirements among architects of modern store fronts. The highest favored construction is one of simplicity, both in construction and installation, permanency, strength, safety to glass and moderate cost. Twenty-eight years of experience has enabled us to build just such a construction—"DESCO." Those architects who have used it are enthusiastic over its performance. See Sweet's catalog. Why not have "DESCO" details in your files?

*Gladly sent upon request*

**DETROIT SHOW CASE COMPANY**

467 Fort Street, W.

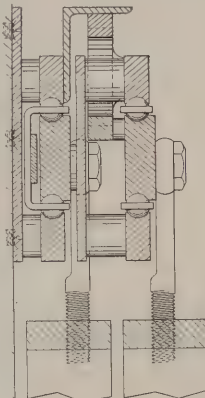
Detroit, Michigan

**Desco**  
METAL  
STORE FRONTS

SIMPLE — RELIABLE — ECONOMICAL — LASTING

FOUR FEATURES THAT ENTER INTO

## Reliance Ball Bearing Door Hangers



commending them to architects who specify them to the eternal satisfaction of their clients.

Years of manufacture and years of use are best proof of their thorough efficiency.

Hangers furnished in both Single and Double. A Double Hanger is here illustrated.

*Write for all facts — and Catalog*

**RELIANCE BALL BEARING DOOR HANGER COMPANY**

Grand Central Terminal Building

New York



*New Building for Pierce Arrow Co., at Buffalo, N. Y.  
Turner Construction Co., Builders*

## Behind the Best Concrete Jobs in the Country



was selected and used in the floors of the new Pierce Arrow Building because these floors had to be *hard* and *waterproof*. Incidentally they are acid, alkali and oil resisting—Anti-Hydro always does a complete job of it.

For twelve years Anti-Hydro has been standing up under the most severe conditions and tests.

Specify Anti-Hydro on your next job—it costs less to put it in than to leave it out.

**ANTI-HYDRO WATERPROOFING CO.**

Singer Bldg., New York

Laboratory, Newark, N. J.

And Principal Cities

We will occupy Booth No. 259 at the Third National Exposition of Chemical Industries



## The Radiator Bugaboo overcome with Decorative Metal Grilles

ALLOW us to offer suggestions for your heating problems, involving the acceptable obscuring of radiators by using decorative metal grilles. Photo taken in Arthur Curtis James' residence, New York. Allen & Collens, Architects.

SEND FOR CATALOG 66-A

**TUTTLE & BAILEY MFG CO.**

52 VANDERBILT AVENUE  
NEW YORK





## Overcoating Solves the Problem of High Cost of Building

All over this country people are anxious to build this Fall, but are deterred by the high cost of building material.

Many of these people now own houses that are out of date. Others can buy property on which old houses are already standing.

We respectfully suggest to architects the possibilities in the rehabilitating of old houses by overcoating them with stucco, and making such necessary additions as seem consistent with symmetry and modern requirements.

### ***Kno-Burn Corrugated Metal Lath***

goes directly on clapboards or sheathing, and in combination with stucco makes a construction of surprising cheapness and unquestioned permanence and beauty. If you are at all interested, we shall be glad to furnish you detailed information. Just ask for "overcoating data."

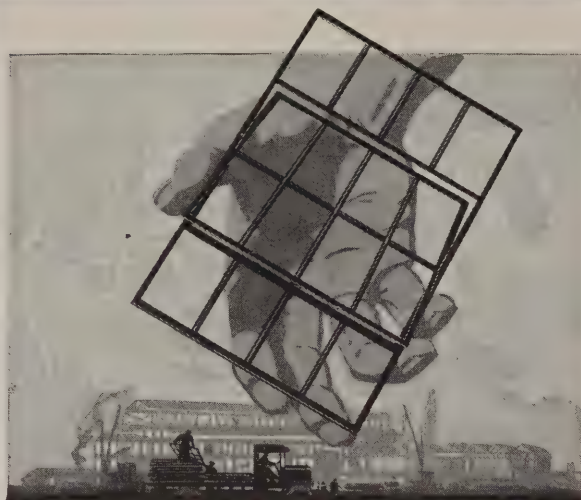
**NORTH WESTERN EXPANDED METAL CO.**

*Member Associated Metal Lath Manufacturers*

934 Old Colony Building

Chicago, Illinois





## For Shipment at Once

This most popular solid steel window and 29 other Fenestra types most frequently employed in modern industrial buildings.

Use them singly or in combination. They offer a wide variety of dimension and ventilation.

Order them now. They'll be on the job when needed.

"Fixed light" or ventilated units ready for shipment can be supplied in the following dimensions:

12' x 18" glass      14' x 20" glass

Heights      Heights

3' 15"      3' 5 3/8"

4' 8"      5' 2"

6' 2 3/8"      6' 10 3/8"

7' 8 3/4"      8' 6 3/4"

9' 3 3/8"      10' 3 3/8"

Widths      Widths

3' 2"      3' 8"

4' 2 3/8"      4' 10 3/8"

5' 2 3/4"      6' 0 3/4"

Y=12"x18" glass      Z=14"x20" glass

Combine Y widths with Y heights. Z widths with Z heights.

**DETROIT STEEL PRODUCTS COMPANY**

2917 EAST GRAND BOULEVARD

DETROIT, MICH.

***Fenestra***  
SOLID STEEL WINDOWS



CRITTALL CASEMENT WINDOW CO., DETROIT

Manufacturers of Steel Windows and Casements

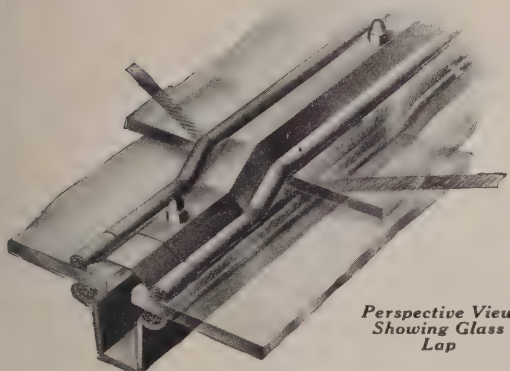


# Protecting War Work



THE Eddystone Ammunition Corporation of the Baldwin Locomotive Works uses 142,000 square feet of Lupton Rolled Steel Skylight — four acres of glass! — to cover portions of its immense factory.

In selecting this skylight it was of the first importance that no water should get through to spoil the costly material beneath. And the patented construction of Lupton Rolled Steel Skylight made it the inevitable choice. It is built to overcome glass breakage through expansion and contraction, leakage through drying of putty and premature failure by corrosion.



Perspective View  
Showing Glass  
Lap

The glass is held, not by contact with metal or by putty, but by resilient strands of oakum, specially saturated and permanently water-proof. Expansion and contraction put no strain on the glass.

Corrosion is minimized by making all parts exposed to weather of brass or copper.

## LUPTON ROLLED STEEL SKYLIGHT

Condensation is carried by sloping oakum strands between the glass laps to gutters in the skylight bars themselves, and thence to the roof outside by drip holes in the copper curb aprons.

The difference in cost of manufacture between Lupton Rolled Steel Skylight and ordinary sheet steel skylight is an investment for the protection of your factory and the long life of your roof.

*Catalogue No. 9 tells all about this and other Lupton products*

### DAVID LUPTON'S SONS COMPANY

Witte and Tulip Streets

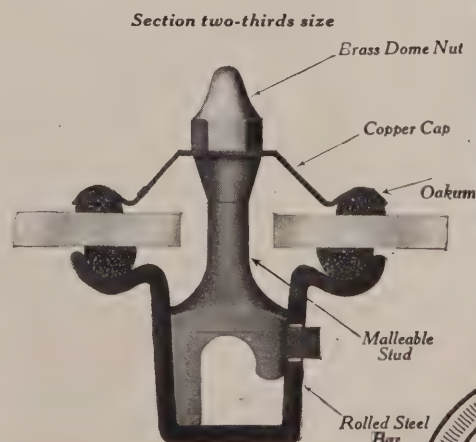
PHILADELPHIA, PA.

#### LUPTON PRODUCTS

Lupton Steel Sash  
Pivoted Factory Type  
Counterbalanced Type  
for Factories

Lupton Steel Sash  
Counterweighted Type  
for offices  
Power House Type

Pond Continuous Sash for Pond Truss,  
sawtooths, monitors and side walls  
Pond Operating Device for long lines of sash  
Lupton Rolled Steel Skylight  
Lupton Steel Partition and Doors  
Lupton Steel Shelving



Section two-thirds size

Erass Dome Nut

Copper Cap

Oakum

Malleable Stud

Rolled Steel Bar

# HECLA IRON WORKS

ESTABLISHED 1876

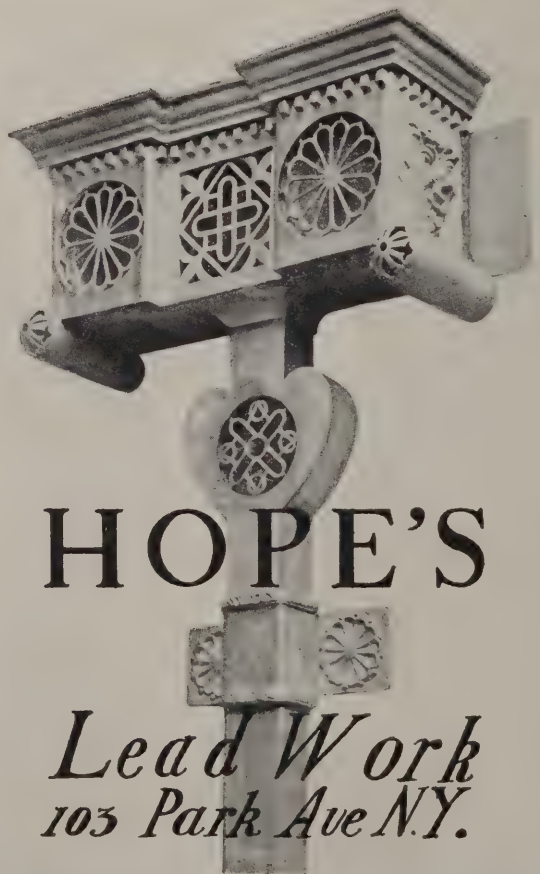
BRONZE AND IRON

118 NORTH 11TH STREET  
BROOKLYN, NEW YORK CITY, N. Y.

## INTERNATIONAL CASEMENTS



OFFICES  
IN PRINCIPAL CITIES  
FACTORIES  
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HOPE'S

*Lead Work*  
103 Park Ave N.Y.



# 96 Varieties of UNITED STEEL SASH in our Warehouse Stock

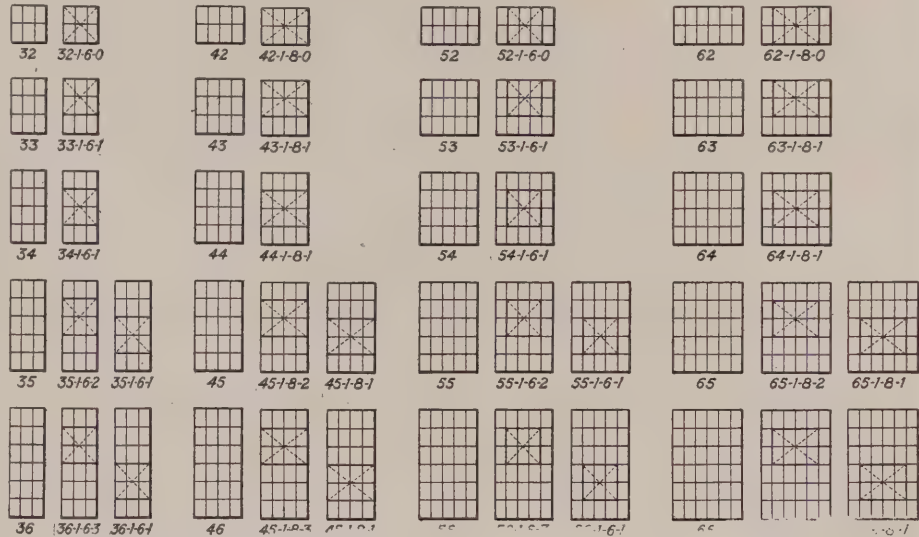
Table of Widths of Window Openings

| Width of Window Openings | Size of Glass | Total Lights Wide | No. Sash Units |
|--------------------------|---------------|-------------------|----------------|
| 3' 3"                    | 12 x 18       | 3                 | 1              |
| 3' 9"                    | 14 x 20       | 3                 | 1              |
| 4' 3"                    | 12 x 18       | 4                 | 1              |
| 4' 11"                   | 14 x 20       | 4                 | 1              |
| 5' 4"                    | 12 x 18       | 5                 | 1              |
| 6' 2"                    | 14 x 20       | 5                 | 1              |
| 6' 4"                    | 12 x 18       | 6                 | 1              |
| 6' 8" to 6' 9"           | 12 x 18       | 6                 | 2              |
| 7' 4"                    | 14 x 20       | 6                 | 1              |
| 7' 8" to 7' 9"           | 14 x 20       | 6                 | 2              |
| 8' 9" to 8' 10"          | 12 x 18       | 8                 | 2              |
| 10' 0" to 10' 2"         | 12 x 18       | 9                 | 3              |
| 10' 1" to 10' 2"         | 14 x 20       | 8                 | 2              |
| 10' 10" to 10' 11"       | 12 x 18       | 10                | 2              |
| 11' 1" to 11' 3"         | 12 x 18       | 10                | 3              |
| 11' 6" to 11' 8"         | 14 x 20       | 9                 | 3              |
| 12' 1" to 12' 3"         | 12 x 18       | 11                | 3              |
| 12' 6" to 12' 7"         | 14 x 20       | 10                | 2              |
| 12' 9" to 12' 11"        | 14 x 20       | 10                | 3              |
| 12' 11" to 13' 0"        | 12 x 18       | 12                | 2              |
| 13' 2" to 13' 4"         | 12 x 18       | 12                | 3              |
| 13' 5" to 13' 8"         | 12 x 18       | 12                | 4              |
| 13' 11" to 14' 1"        | 14 x 20       | 11                | 3              |
| 14' 2" to 14' 4"         | 12 x 18       | 13                | 3              |
| 14' 11" to 15' 0"        | 14 x 20       | 12                | 2              |
| 15' 2" to 15' 4"         | 14 x 20       | 12                | 3              |
| 15' 3" to 15' 5"         | 12 x 18       | 14                | 3              |
| 15' 5" to 15' 8"         | 14 x 20       | 12                | 4              |
| 15' 6" to 15' 9"         | 12 x 18       | 14                | 4              |
| 16' 3" to 16' 5"         | 12 x 18       | 15                | 3              |
| 16' 4" to 16' 6"         | 14 x 20       | 13                | 3              |
| 17' 4" to 17' 6"         | 12 x 18       | 16                | 3              |
| 17' 7" to 17' 9"         | 14 x 20       | 14                | 3              |
| 17' 7" to 17' 10"        | 12 x 18       | 16                | 4              |
| 17' 10" to 18' 1"        | 14 x 20       | 14                | 4              |
| 18' 4" to 18' 6"         | 12 x 18       | 17                | 3              |
| 18' 9" to 18' 11"        | 14 x 20       | 15                | 3              |
| 19' 5" to 19' 7"         | 12 x 18       | 18                | 3              |
| 19' 8" to 19' 11"        | 12 x 18       | 18                | 4              |
| 20' 0" to 20' 2"         | 14 x 20       | 16                | 3              |
| 20' 3" to 20' 6"         | 14 x 20       | 16                | 4              |
| 21' 2" to 21' 4"         | 14 x 20       | 17                | 3              |
| 21' 9" to 22' 0"         | 12 x 18       | 20                | 4              |
| 22' 5" to 22' 7"         | 14 x 20       | 18                | 3              |
| 22' 8" to 22' 11"        | 14 x 20       | 18                | 4              |
| 23' 10" to 24' 1"        | 12 x 18       | 22                | 4              |
| 25' 1" to 25' 4"         | 14 x 20       | 20                | 4              |
| 25' 11" to 26' 2"        | 12 x 18       | 24                | 4              |
| 27' 6" to 27' 9"         | 14 x 20       | 22                | 4              |
| 29' 11" to 30' 2"        | 14 x 20       | 24                | 4              |

Table of Heights of Window Openings

| Height of Window Openings | Size of Glass | Total Lights High | No. Sash Units |
|---------------------------|---------------|-------------------|----------------|
| 3' 2"                     | 12 x 18       | 2                 | 1              |
| 3' 6"                     | 14 x 20       | 2                 | 1              |
| 4' 8"                     | 12 x 18       | 3                 | 1              |
| 5' 2"                     | 14 x 20       | 3                 | 1              |
| 6' 3"                     | 12 x 18       | 4                 | 1              |
| 6' 11"                    | 14 x 20       | 4                 | 1              |
| 7' 9"                     | 12 x 18       | 5                 | 1              |
| 8' 7"                     | 14 x 20       | 5                 | 1              |
| 9' 4"                     | 12 x 18       | 6                 | 1              |
| 10' 4"                    | 14 x 20       | 6                 | 1              |

You have a choice of 48 distinct types—each in two glass sizes—in stock units of United Steel Sash. By combining these units you can meet any practical requirements as regards ventilation and size of window opening. Best of all, these stock units are stored in our warehouse ready for immediate shipment. Avoid delays and save money by selecting stock units of United Steel Sash.



Stock Units of United Steel Sash. Furnished in two Glass sizes, 12" x 18" and 14" x 20"

## Select Your Sash from These Units and Tables

Tables show widths and heights of window openings and sizes of sash to fit them. Diagram shows types of sash and arrangement of ventilation for each size of unit. In selecting units always use the same glass size as regards width and height.

We also furnish Semi-Stock Sash (ventilators carried in stock) and To-Order Sash in pivoted and sliding sash, continuous sash, partitions, doors, etc.

Write for Stock Sash Pamphlet or Complete Sash Handbook

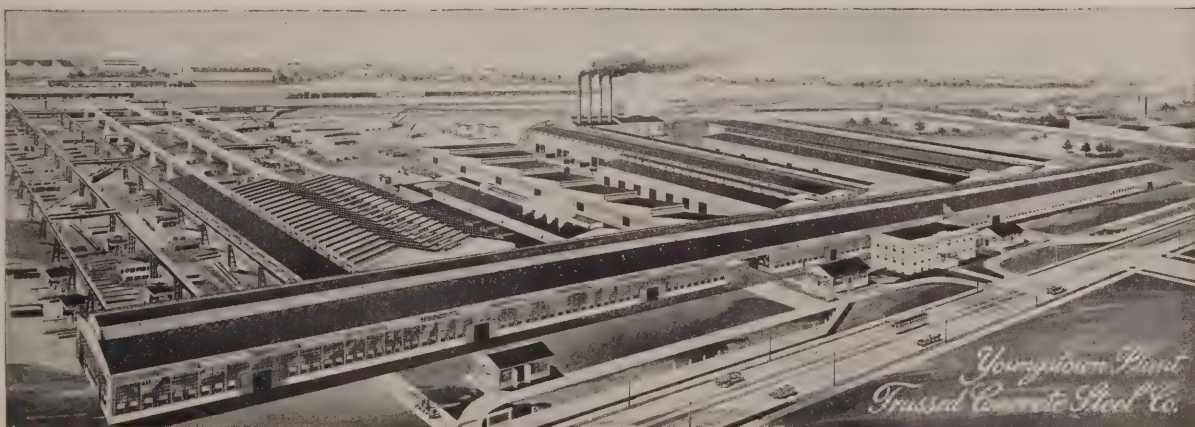


## Trussed Concrete Steel Co.

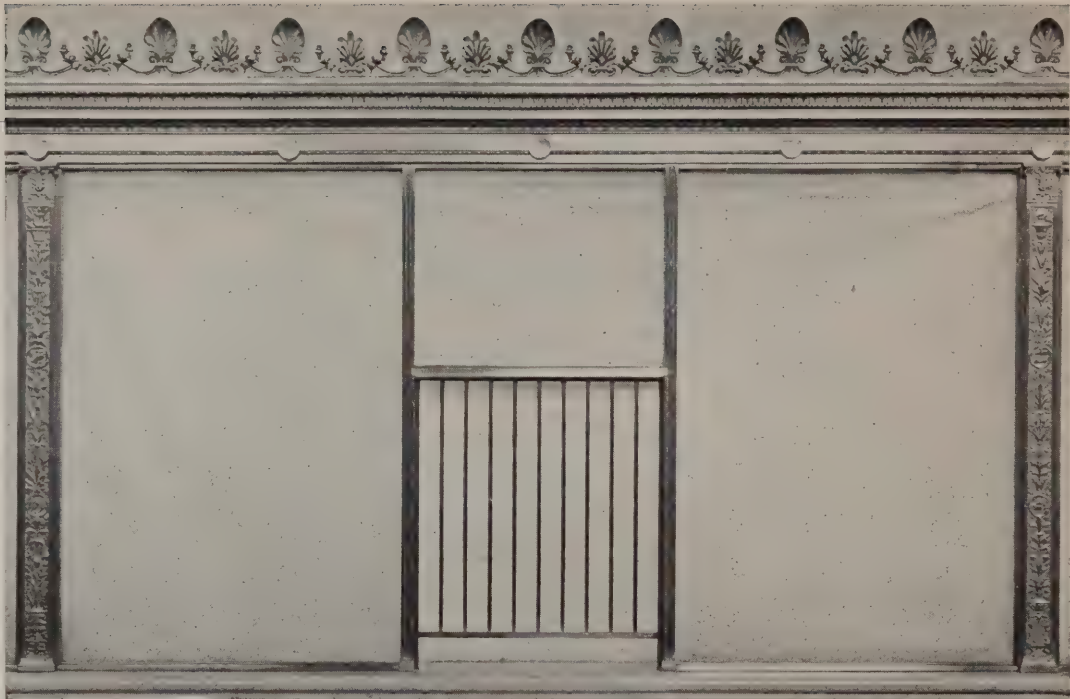
Steel Sash Dept. 57

Youngstown, Ohio

Representatives in Principal Cities



The warehousing and manufacturing facilities for United Steel Sash



A BRONZE COUNTERSCREEN  
OF EXCEPTIONAL DELICACY AND REFINEMENT  
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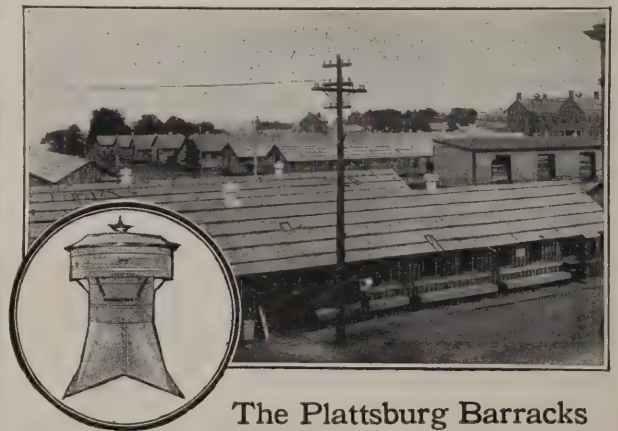
## Columbian Sash & Pulleys

*Standard in Size,  
in Quality, in  
Satisfactory Service*

*In Stock Ready to Ship*

**The Columbian  
Hardware Company**

Manufacturers Cleveland, O., U. S. A.



**The Plattsburg Barracks**

which house the men training to be the future officers of the United States Army, are equipped with three hundred and twenty

**"STAR"  
VENTILATORS**  
Patented

Pure, fresh air being the first essential to the vigorous health these men must possess, the selection of "Star" Ventilators is an indication of their ability to provide the best ventilation.

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NEW ASTOR TRUST BUILDING, NEW YORK  
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LOOKING TOWARDS FIFTH AVENUE

# *The Final Test in School Architecture*

THE final test of an architect's success in school building is the fire gong—the cry of panic. What avails beauty of line and fineness of detail when helpless children are penned in to be crushed or burned.

Not a pleasant thought—but fires and panics do happen in spite of all precautions. Guard against them in your school buildings—have a free mind by installing

## Von Duprin

Trade Mark Reg. U. S. Pat. Office. No. 85021 Pat. U. S. and Can.

### Self-Releasing Fire Exit Latches

They are standard the world over. Everywhere leading school architects specify **Von Duprins'** exclusively because they have found them "best by test."

**Von Duprin** devices act instantly—unfailingly—on the slightest *push or pull on the crossbar*. The smallest child in school can operate them. Nothing to get out of order. They are as safe after years of service as the first day they are installed.

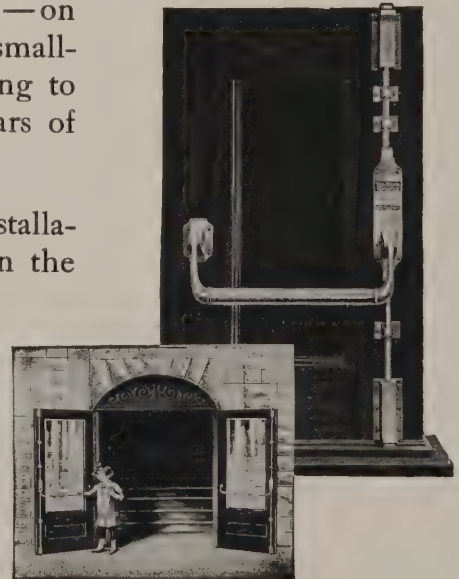
**Von Duprin** devices are shipped ready for installation. No change or adjustments necessary on the job.

*Our service department is at your disposal  
Write for Catalog 12-F, or see Sweet's Catalog*

VONNEGUT HARDWARE CO.

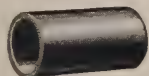
INDIANAPOLIS, INDIANA

*Manufacturers and Distributors*





# DANNITE—the anti-friction Bearing.



The Bearing

—Dannite combined  
with a Specially-Treated  
Bronze Metal.

Sash-Pulleys, *Dannite-equipped*, combine the easy-running, long-wearing qualities of roller- and ball-bearing pulleys with the simplicity and economy of plain-axle. The wheel, on a Dannite bearing, can't squeak.



The Wheel

## Proving the Value of Dannite

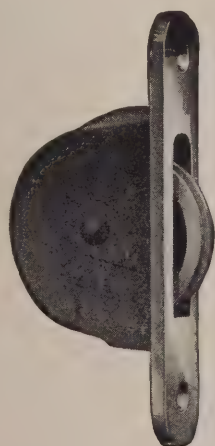
This is the test we ran. A plain-axle pulley with a  $\frac{1}{4}$ -in. pin and a  $2\frac{1}{2}$ -in. wheel fitted with a Dannite Bearing, carrying a rope and a weight representing a load of 534 lbs. per sq. in. on the pin, was operated for  $91\frac{1}{2}$  hrs. in our testing machine.

The vertical travel was 8 ins. At 40 trips per minute, the weight was raised and lowered 219,600 times, or a total travel of 292,800 feet. Assuming a daily travel of 6 feet for the average window-sash, the year around, this represented the *use a pulley would get in 133 years!*

When we stopped the test the pulley showed a radial enlargement of only .001 in. The pin was smooth and unworn. Dannite builds up on the pin its own lubricating coating, rust-proof and fire-proof.

How long we could have run the test is indeterminate. It seems as though we might have been running it yet.

For permanently satisfactory results, specify any  
*good Sash-Pulley equipped with Dannite Bearings.*



The Better Sash-Pulley

Any Standard Make  
*Dannite-Equipped*

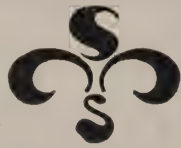
DANNITE has a wide application in mechanical and industrial fields as an ideal anti-friction no-oil bearing. May we have the privilege of keeping you informed on developments? Please address us directly.

## THE DANN PRODUCTS CO.

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NO-OIL BEARING

GENERAL OFFICES  
CLEVELAND, OHIO

**DANN INSERT**  
THE LUBRICATED SPRING-LEAF BEARING



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Fine Unfading Maine and Vermont Slates

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House at  
Cottage Farms,  
near Boston.  
Its roof is a  
good example  
of the pleasing  
texture of  
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and Green Opal  
slates used  
together in  
various lengths  
and random  
widths, with  
soft and  
informal effect.

## A Reputation for Reliability—



has followed *Keystone Copper Steel* ever since it was first placed upon the market. Its excellence was proved in actual service before we offered this alloy material for Black and Galvanized Sheets and Roofing Tin Plates.

*Apollo-Keystone Galvanized is without a peer  
for durability and rust-resistance.*

Look for the special Keystone mark added to regular brands. Shall we send Keystone booklets showing series of interesting weather tests?

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Minneapolis'  
Greatest Buildings  
are roofed with

*Carey Roofing*

CAREY Roofing is a necessity for such modern structures as the First National Soo Line Building illustrated above. For almost half a century it has been steadily growing in favor with architects and builders—and with the owners of buildings.

Today it is recognized as the standard composition roofing of America—proved such by its unrivaled service on thousands of buildings, great and small, in all parts of the continent.

Carey Roofing can be applied to any form of construction. It may be installed in factory-made sections with joints cemented together by means of the Carey Patent Lap or it may be built-up on the job, course by course, to any specified thickness.

We are prepared to give estimates on roofing for any class of buildings.

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## Do you know *The Ja-Nari*

(Sylphon Temperature Control)



**H**AVE you investigated this simple method of temperature control which covers the radiator with a well designed cabinet finished to match mahogany, oak, walnut or enamel (white or tinted) to correspond with its surroundings?

It operates automatically on the well known Sylphon principle of thermostatic control and requires no pipes, wires or connections of any kind. Costs nothing to install or operate. Just place it over the radiator. Each one works independently. Specify it for one room or several.

Send for Catalogue D and full information

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New York

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**IF** you specify and use Berger's Raydiant Roof Lights on your roof and Floor Lights in your floors beneath, you will have daylight diffused from roof to basement without reducing valuable floor space.

The Raydiant System is simple, strong, durable, watertight and easily installed. Glass accidentally broken is quickly and easily replaced in our "Special" system, permitting an installation to be kept in perfect condition at small cost.

*See Sweet's, pages 834-837, and Write for Catalog T. F.*

**The Berger Mfg. Co., Canton, Ohio**

Branches: Boston New York Philadelphia Chicago  
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**No Building  
Can Be  
Better Than  
Its Roof**

*Gedney Farm Hotel, White Plains, N. Y.  
Kenneth M. Murchison, Architect*

No matter how well proportioned a building, no matter how well built, if the roof of that building does not insure absolute protection as well as perfect conformation to type, you would not want to be known as the builder.

### Bayonne Roof and Deck Cloth

lends itself equally to protection and perfection. Being laid on dry boards, it offers unusual possibilities of painting and finishing afterward, to obtain any desired effect. Being water-proof, weather-proof and wear-proof, it will resist the ravages of the elements longer than any other roofing material.

Bayonne does not buckle or rust. Fits smoothly into corners like canvas, yet cannot shrink. Can be kept clean by sluicing with water, like cement, yet it is the most economical roofing material on the market.

Bayonne is recommended for roofs, sleeping porches, conservatories, piazzas and all places receiving constant wear. Send for Free Sample Book "S."

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## Self-Firing EFFICIENCY of the

### GORTON SELF-FEEDING BOILER

The inside of the water leg of a Gorton Self-Feeding Boiler being cone shaped, the coal in the reservoir feeds down into the fire just at the rate of consumption, but no faster, thus maintaining a steady fire and furnishing a constant supply of



*Wrought Plate Water Leg*  
heat for 12 hours in zero weather without attention.

Pages 3, 4, 9, 11, and 13 of Catalog No. 88 tell how.

OUR NEW NO. 88 CATALOG IS READY—WILL BE SENT UPON REQUEST

## Gorton & Lidgerwood Co.

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All Gorton Self-Feeding Boilers built to the  
"A. S. M. E. Standard"





*The* ARISTOCRAT of BUILDING MATERIALS

\$12,000 Residence Competition—Awards

### Awards in the Competition

FOR A DETACHED RESIDENCE FACED WITH INDIANA LIMESTONE

ON August 1, the Jury, consisting of Franklin Abbott of Pittsburgh, J. E. R. Carpenter of New York, Ralph Adams Cram of Boston, Charles Z. Klauder of Philadelphia, and Richard E. Schmidt of Chicago, met at Nantucket, Mass., and, after two days of most thorough examination of the designs submitted, awarded the following prizes and mention:

FIRST PRIZE, \$700.00  
ALFRED FELLHEIMER  
STEWART WAGNER  
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SECOND PRIZE, \$500.00  
ROBERT A. TAYLOR, 310 Browning Rd., West Collingswood, N. J.

THIRD PRIZE, \$200.00  
E. J. MAIER  
THOS. EWING KING  
GEORGE H. ERARD  
1234 Ohio Bldg., Toledo, Ohio

FOURTH PRIZE, \$100.00  
OLAF WILLIAM SHELREN  
808 Niagara Bldg., Buffalo, N. Y.

MENTIONS  
O. R. EGGERS  
ALFRED COOKMAN CASS  
ALBERT HARKNESS  
SEPTIMUS WARWICK, 390 Sherbrooke St. W. Montreal, Que., Can.  
EDWIN J. SCHMITT  
RUSSELL BARR WILLIAMSON  
2333 Creston Ave., New York City  
Kansas City, Mo.

These designs will all be published in our September issue, a copy of which will be sent free to all competitors.

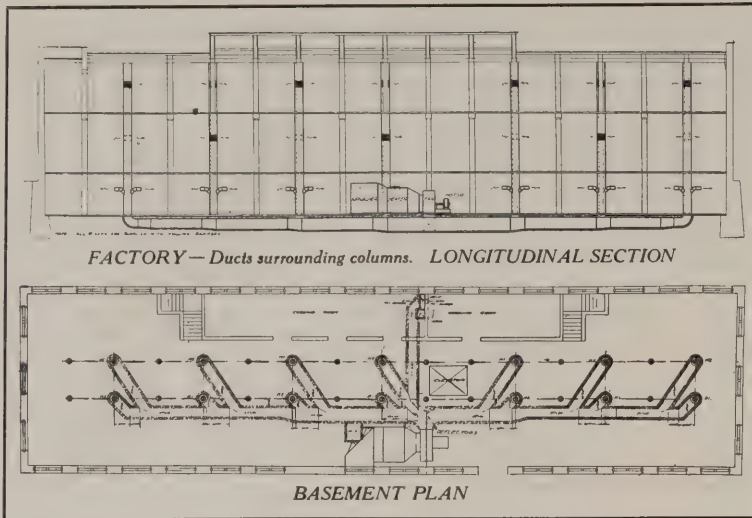
THE ARCHITECTURAL REVIEW.

Boston, August 8, 1917

THE COMPETITION PROVED TO BE AN INTERESTING DEMONSTRATION OF THE POSSIBILITIES OF INDIANA LIMESTONE IN THE CONSTRUCTION OF THE MEDIUM PRICED HOUSE.

AS SOON AS PUBLISHED, SHEETS SHOWING THE WINNING DRAWINGS WILL BE SENT WITH OUR COMPLIMENTS TO ANY MEMBER OF THE PROFESSION WHO REQUESTS THEM.

Indiana Limestone Quarrymen's Ass'n., BOX 505 Bedford, Indiana.



## A Factory Heating and Ventilating Layout

Cut shows longitudinal section and basement plan of a Factory Heating and Ventilating Layout reduced in size from our 28-page Blue Print Book, Bulletin No. 227. This book also shows first and second floor plans of same factory. In this system the ducts surround the columns.

Bulletin 227 includes layouts for all types of buildings, and reference to the drawings will usually suggest ways of making any particular installation.

IT IS SENT FREE WHEN REQUEST IS WRITTEN UNDER YOUR LETTERHEAD

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(REG. U. S. PAT. OFF.)

The services of our Engineering staff are at the disposal of Architects and Engineers

## B. F. STURTEVANT COMPANY

DEPT. B, HYDE PARK, BOSTON, MASSACHUSETTS

And All Principal Cities of the World

Fans, Heaters, Air Washers, Stationary Vacuum Cleaners, Motors, Engines

Made in a variety of patterns — globe, angle, offset globe, regular corner, offset corner, fractional; with wood wheels, brass wheels or lock shields; plain, finished or nickel plated. There is never any question about the quality of



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— they are “time tested and performance proved.”

They are capable of withstanding not only all working pressure to which they are likely to be subjected, but have a very liberal factor of safety besides — a great advantage when possible abuse is taken into consideration.

*We carry a liberal stock in various styles of finish, and are prepared to make prompt shipments*

### JENKINS BROS.

New York

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The old-fashioned church was usually ventilated poorly, if at all. Architects now specify . . . . .

## “GLOBE” VENTILATORS

Because they are not only simple, strong, long wearing and absolutely silent, but because they operate so efficiently and harmonize so well with the architectural features of the modern church. For information, address Department P.

GLOBE VENTILATOR CO.  
TROY, N. Y.



# CLARAGE

## KALAMAZOO

### Multiblade Fans

#### *We Advise—*

the use of Steel or Iron products only where the conditions warrant their use when taking into consideration the **need for war materials** and the resulting shortage for ordinary purposes. **Do your bit** in helping to relieve the unusual demand on the Steel Mills.

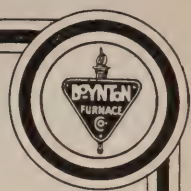
Ventilating apparatus should be installed only where the improved conditions will, by increasing the efficiency of the occupants of the room and speeding up the output, or by reducing the amount of time lost through sickness, warrant the use of material in this manner and pay dividends on the investment.

If you are contemplating the installation of such equipment, our Engineers will be glad to assist in planning an economical, efficient installation. And you will be interested in Clarage Multiblade Fans because of the power-saving features and the general design which is intended to reduce repair charges and make for permanent installations.



## CLARAGE FAN COMPANY.

HEATING, VENTILATING & DRYING ENGINEERS.  
KALAMAZOO—MICHIGAN—U. S. A.



*Make it possible for your client to  
decrease his coal bills by specifying*

# BOYNTON SQUARE POTS



**SQUARE POT BOILER**

*Patented*

Front sectional view. All  
parts incline upward to-  
ward front

WE CLAIM FOR SQUARE POTS GREATEST  
**CAPACITY, ECONOMY  
and RELIABILITY**

A continued increasing output is the  
best evidence that our claims for  
Square Pot efficiency are correct.

Our new sixty-page book, "Square Pot Heat-  
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formation—the **REASONS** for Square Pot  
construction. Write for it.

We value the opportunity to submit suggestions  
adaptable to your *special requirements* without  
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## BOYNTON FURNACE COMPANY

*"The Square Pot Makers"*

**BOILERS**

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**RANGES**

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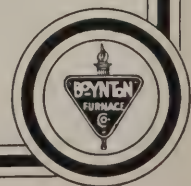
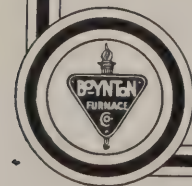
**NEW YORK**

**JERSEY CITY**

129-131 W. Lake Street

106 W. 37th Street

230 Pacific Avenue







Huguenot School, New Rochelle, N. Y. Heated by indirect steam. 100 tons burned to heat fifteen rooms. School has to be dismissed during cold snaps.

## KELSEY HEALTH HEAT



Weyman Avenue School, New Rochelle, N. Y. Heated by six No. 30 Kelsey Generators. 90 tons burned to heat seventeen rooms. Scholars and teachers kept warm and comfortable during the severest weather.

# An Instance Of Kelsey School Heating Satisfactoriness

THE school shown at the right, is the Weyman Avenue School, at New Rochelle, New York.

It was originally an eight-room building. Four furnaces were installed to heat it. Result was unsatisfactory.

In 1909, when a nine-room addition was made, the four furnaces were taken out, and six No. 30 Kelsey Warm Air Generators put in, and run in connection with Sirocco Blower Air Filter and electric motor.

They deliver 26,000 cubic feet of fresh outside air, properly warmed, per minute.

In 1913, but 90 tons of coal were used.

The Huguenot School (also at New Rochelle) shown at the left, contains fifteen rooms.

An indirect steam system was installed. It burns 100 tons to heat fifteen rooms. Every time a cold snap comes along, it is necessary to dismiss school.

Kelseys burn 90 tons to heat seventeen rooms *satisfactorily*. Indirect steam system burns 100 tons to heat fifteen rooms *unsatisfactorily*.

Our School Folder gives other *direct comparison* instances of Kelsey satisfactoriness for school heating.

You are most heartily welcome to a copy of it.

NEW YORK  
103-A Park Avenue  
DETROIT  
Space 95A Builders'  
Exchange

**THE KELSEY**  
WARM AIR GENERATOR  
238 James Street, Syracuse, N. Y.

CHICAGO  
217-A West Lake St.  
BOSTON  
405-A P. O. Square  
Building

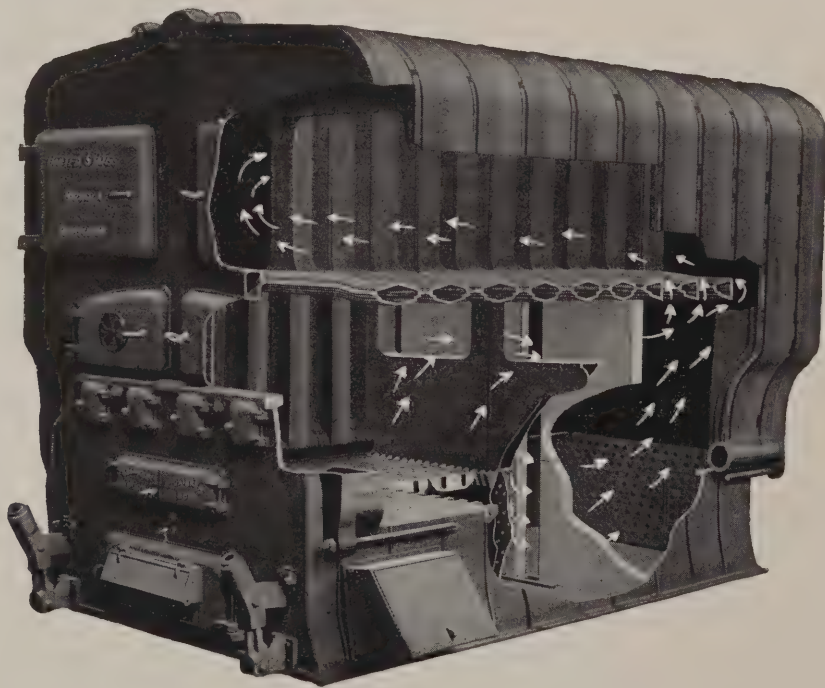
# CAPITOL BOILERS

## SMOKELESS TYPE

**A**re specified and installed because they meet the rigid requirements demanded by Smoke Inspectors and Smoke Abatement Leagues.

**C**apitol Boilers (Smokeless Type) are designed to burn any grade of bituminous coal, smokelessly. This guarantees large savings in fuel expense.

**T**he volatile gases are directed into the mixing chamber and against the fire-brick ignition wall from whence any unconsumed gas reaches the combustion chamber and complete combustion takes place.



Showing interior  
construction  
and  
fire travel

SEND FOR DESCRIPTIVE BOOKLET

*UNITED STATES RADIATOR CORPORATION*

GENERAL OFFICES: DETROIT, MICHIGAN

BRANCH OFFICES IN PRINCIPAL CITIES



# "Sirocco"

TRADE MARK

## Ventilating Fans in One of California's Finest

This magnificent building, The Los Angeles Trust and Savings Bank, is served by Sirocco Ventilating Apparatus.

That Sirocco Equipment is so consistently selected for duty in buildings of the better and more costly type, is surely significant of Sirocco's success in performing according to specifications.

*Architects and Engineers have at their command the assistance of the Engineers of our various branch offices. Our desire is to serve well*

Parkinson & Bergstrom, Los Angeles, Architects  
Thomas Haverly Co., Contractors

AMERICAN BLOWER CO  
DETROIT MICH





SHERARDUCT was used exclusively in the Doe Library, a portion of the magnificent University of California group at Berkeley, California.

# SHERARDUCT

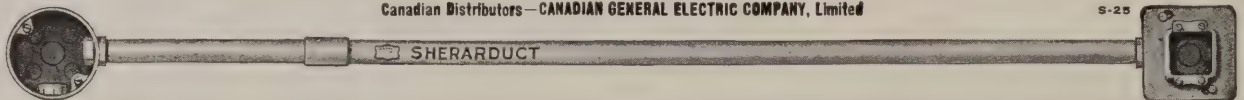
*Sherardized Rigid Steel Conduit*

**National Metal Molding Co**

Manufacturers  
Electrical Conduits and Fittings  
1112 Fulton Building, Pittsburgh, Pa.

Atlanta Boston Buffalo Chicago Dallas Denver Detroit Los Angeles New York Philadelphia Portland Salt Lake City San Francisco Seattle St. Louis  
Buenos Aires Havana Manila Paris

Canadian Distributors—CANADIAN GENERAL ELECTRIC COMPANY, Limited



Architect

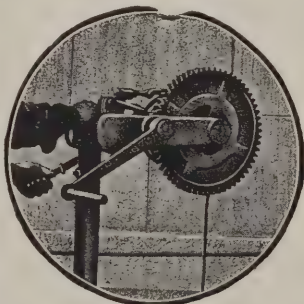
John Galen Howard

Engineers

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NePage McKinney Co.



## A Single Movement

**The G&G**  
*Telescopic Hoist*  
with Automatic Gear Shifting Brake Device and Silencer.

of brake lever automatically shifts gears and applies brake so that load is lowered with no movement of hoisting handle.

This is only one of the many features built into the G&G Telescopic Hoist which makes it the easiest, safest and most efficient apparatus for removing ashes from cellar to sidewalk.

In addition to Model A, illustrated, four other types of Telescopic Hoists are built for various types of installations. Each type is constructed so that when not in use the entire hoist telescopes and no part shows above sidewalk.

Bulletin describing all models will be sent on request.

**GILLIS & GEOGHEGAN**

544 West Broadway

New York



INSTALLATION AT  
4TH PRECINCT POLICE STATION  
CITY OF NEW YORK, OWNER  
HOPPIN & KOEN, ARCHTS.







# House Drains that can't stand the Sanitary Test *will not* be approved by the Plumbing Inspector

Suit to test the city ordinance, providing for plumbing inspector and naming his duties, was filed in court yesterday by the Chalmers Manufacturing company, who are erecting a building at Greenlawn avenue and the Erie railroad. They secured Harry DeWitt as contractor and he in turn engaged John Scully as plumber.

When the building reached the point where Edward Ashton, city plumbing inspector, was to go over the same and sanction approval of the plumbing system, Ashton informed the company and contractors he would use a ten-foot head of water test. This the contractors aver the drains will not stand and claim the same is unjust in this test.

Ashton, according to the petition, stated he would arrest the contractors unless they tore up the drains and complied with his order. He refused to give his approval of the system.

Upon contractors providing a bond of \$300 in court today, Ashton was temporarily enjoined from interfering with the construction and completion of the house drains and from using and enforcing the 10-foot

head of water test on the drains, which are of earthenware pipe, of the quality and character provided by the state plumbing law. The joints are of mortar, made of one part of the best Portland cement and one part of clean, sharp sand. Ashton wanted to use the test for a period of 15 minutes.

*Lima, Ohio  
Democrat  
June 9  
1917*

## Too bad they didn't use CAST IRON SOIL PIPE!

Wherever a sanitary test is to be made, CAST IRON HOUSE DRAINS, AND HOUSE SEWERS, are installed in less time and at less cost than pipe of any other material



CAST IRON SOIL PIPE, in call of Ohio State University, Columbus, Ohio, replacing vitrified pipe that became clogged up with roots.

Every town in America is learning through costly experience the lessons of sanitation and house drainage economy. Today 'modern' plumbing codes insist on CAST IRON SOIL PIPE for *all* house drainage.

**USE SOIL PIPE WHERE SOIL PIPE SHOULD BE USED**

*Profit by their Experience*

**ARCHITECTS  
PLUMBERS  
ENGINEERS  
BUILDERS**

**Use CAST IRON SOIL PIPE**  
for SOIL LINES VENT LINES  
LEADER LINES WASTE LINES

No corrosion - No menace of leaking sewage and sewer gases - No leaking out of floors and walls after pipe is installed

**Use CAST IRON SOIL PIPE**  
for HOUSE DRAINS HOUSE SEWERS

No pollution under cellars - No stoppage by tree roots - No danger of breakage by jar or settlement - No costly replacements

**CAST IRON SOIL PIPE LASTS LONGER THAN THE BUILDING**

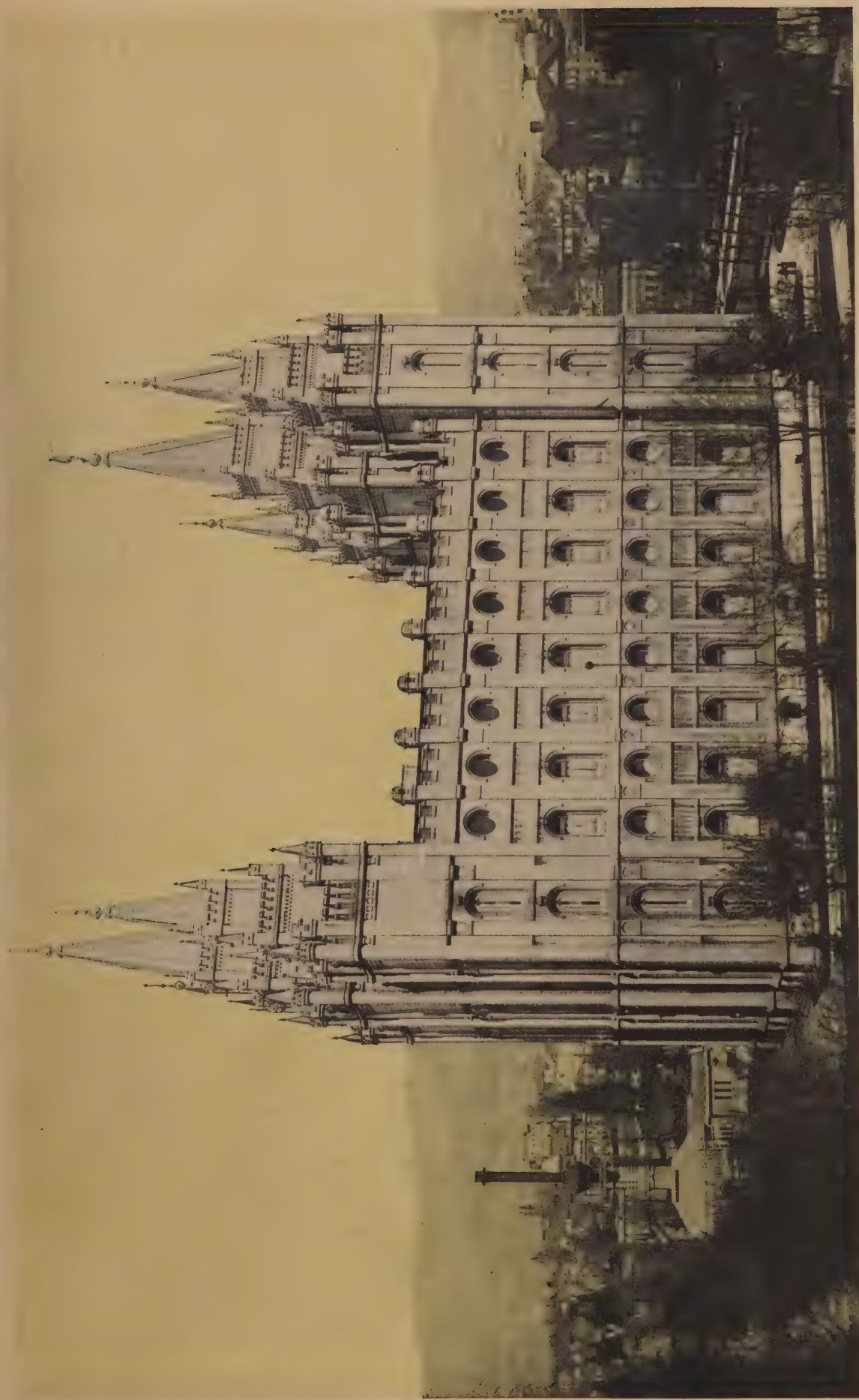
**IN THE BUILDING UNDER THE GROUND**

**SANITATION ECONOMY PERMANENT SERVICE**

Specifications and literature will be mailed upon request by any or all of the following independent and competing makers of Cast Iron Soil Pipe and Fittings:

|                                     |                     |                                 |                    |
|-------------------------------------|---------------------|---------------------------------|--------------------|
| Krupp Foundry Co.                   | Leedsale, Pa.       | Alabama Pipe & Foundry Co.      | Ansonia, Ala.      |
| Madison Foundry Co.                 | Medina, N. Y.       | American Engineering Mfg. Corp. | New York, N. Y.    |
| National Foundry Co. of N. Y., Inc. | Brooklyn, N. Y.     | American Foundry & Pipe Co.     | Penne Sta., Pa.    |
| National Pipe & Foundry Co.         | Astoria, Ala.       | Ansonia Foundry Co.             | Ansonia, Ala.      |
| Reading Foundry & Supply Co.        | Reading, Pa.        | Bessemer Soil Pipe Co.          | Bessemer, Ala.     |
| Salom Brass & Iron Mfg. Co.         | Salom, N. J.        | Campbell Mfg. Co.               | Oakden, Ala.       |
| Sanitary Co. of America             | Linfield, Pa.       | Casey-Hedges Co., The           | Chattanooga, Tenn. |
| Somerville Iron Works               | New York, N. Y.     | Central Foundry Co.             | New York, N. Y.    |
| Standard Foundry Co.                | Ansonia, Ala.       | Charlotte Pipe & Foundry Co.    | Charlotte, N. C.   |
| Superior Mfg. Co.                   | Bessemer, Ala.      | Cooke Pipe & Foundry Co.        | Birmingham, Ala.   |
| Union Foundry Co.                   | Ansonia, Ala.       | Crown Pipe & Foundry Co.        | Jackson, Miss.     |
| Wieland & Son Co., A.               | Baltimore, Md.      | Gadsden Pipe Co.                | Oakden, Ala.       |
| Wetter Mfg. Co., H.                 | Memphis, Tenn.      | Haines, Jones & Cadbury Co.     | Philadelphia, Pa.  |
| Abendroth Brothers                  | Port Chester, N. Y. | Johnson Co., J. D.              | New York, N. Y.    |





MORMON TEMPLE  
SALT LAKE CITY, UTAH

Another "NATIONAL"ized Building

# "NATIONAL" Pipe in Large Buildings



## Mormon Temple Salt Lake City, Utah



☞ This unique building was under construction for nearly a half century. The walls are 220 feet high and the ground plan covers a space 99 x 186 feet.

☞ As the building neared completion, a modern heating system was installed. A central heating plant furnishes heat to the Temple, the Tabernacle and also to the Hotel Utah.

☞ Throughout the entire heating system

### "NATIONAL" Pipe Was Installed.

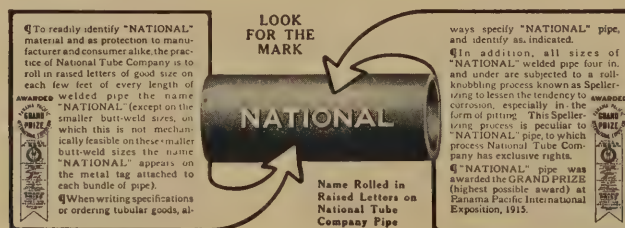
☞ This is further evidence that exacting builders, striving for the highest type of construction, have complete confidence in the qualities of "NATIONAL" Pipe.

Complete information about "NATIONAL" Pipe may be found on pages 1339-1351, inclusive, of the 1917 edition of Sweet's Catalogue.

This is the seventh of a series of "NATIONAL"ized buildings as follows:

THE UNION ARCADE, Pittsburgh, Pa.  
American Architect, Feb. 21st, pages 60-61.  
Architectural Forum, March, pages 41-42.  
Buildings & Building Management, May, pages 23-24.  
THE EQUITABLE BUILDING, New York, N.Y.  
American Architect, March 21st, pages 19-20.  
Architectural Forum, April 1st, pages 35-36.  
CONTINENTAL & COMMERCIAL NATIONAL BANK BUILDING, Chicago, Ill.  
American Architect, May 2nd, pages 21-22.  
Architectural Forum, May, pages 45-46.  
Buildings & Building Management, June, pages 23-24.

HOTEL TRAYMORE, Atlantic City, N. J.  
Architectural Forum, June, pages 39-40.  
Buildings & Building Management, July, pages 23-24.  
JOHN WANAMAKER COMPANY BUILDING, Philadelphia, Pa.  
Architectural Forum, July, pages 33-34.  
Buildings & Building Management, August, pages 23-24.  
DODGE BROTHERS MOTOR CAR COMPANY MANUFACTURING PLANT, Detroit, Mich.  
Architectural Forum, August, pages 37-38.  
Buildings & Building Management, Sept., pages 23-24.



## NATIONAL TUBE COMPANY

General Sales Offices, Frick Building, Pittsburgh, Pa.

### DISTRICT SALES OFFICES

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Boston

Chicago  
Denver

Kansas City  
New Orleans

New York  
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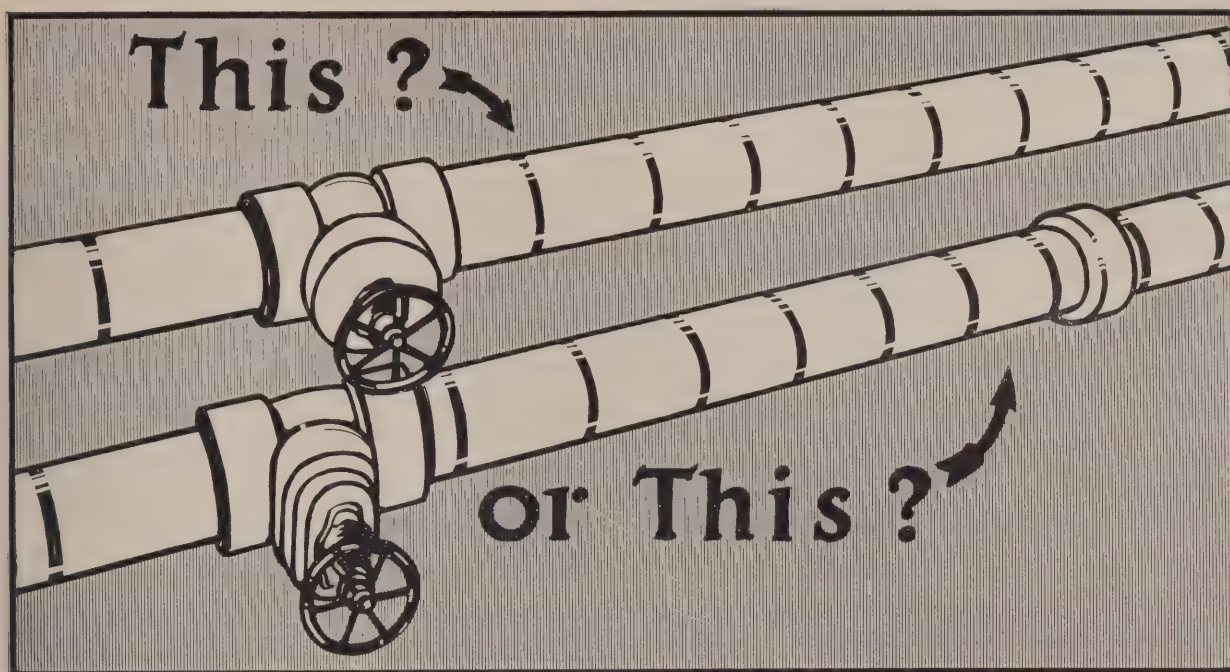
St. Paul  
Salt Lake City

Pacific Coast Representatives: U. S. Steel Products Co., San Francisco, Los Angeles, Portland, Seattle

Export Representatives: U. S. Steel Products Co., New York City

(See preceding page for illustration)





Both these pipe coverings look alike, but there the resemblance ends.

*One* was specified as a "suitable covering." It is such a poor one that the heat passes through it easily. In fact, as an efficient heat-saver, it is a fraud.

The *other* has been known for over a quarter of a century as the best of all practical Heat-Savers, in the conservation of energy derived from steam.

"85% Magnesia" is this best covering. It saves coal because it prevents the waste of heat from the steam lines, so that less steam is required to do the work.

Where "85% Magnesia" is used, all condensation losses, all water logged

steam-traps, and heat wasted in alleyways or around corners are reduced to a minimum.

Therefore, "85% Magnesia" has been adopted by the world's leading engineers as the standard pipe and boiler covering of the world.

"85% Magnesia" has been saving millions of dollars a year on coal bills, from the largest heating and power plants down to the smallest household heating installations.

It saves enough coal to pay for itself in a very short time. It will reduce your coal bills also, if you will let it.

*The complete and scientific Specification for applying "85% Magnesia" properly, issued by the Magnesia Association of America, is sent free to any one interested in pipe or boiler insulation.*

---

# "85% MAGNESIA"

## The Universal Covering for Pipes and Boilers

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MAGNESIA ASSOCIATION OF AMERICA, 702 BULLETIN BLDG., PHILADELPHIA, PA.  
(The member companies of this Association are contractors to the U. S. Army and Navy and to munition plants.)

### EXECUTIVE COMMITTEE

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Alvin M. Ehret, Ehret Magnesia Mfg. Co., Valley Forge, Pa. R. V. Mattison, Jr., Keasbey and Mattison Co., Ambler, Pa.



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Vancouver  
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Wichita  
Winnipeg

#### Works:

Chicago and  
Bridgeport

### Typical CRANE Bathroom

Let us send you our booklet entitled  
"Plumbing Suggestions for Home Builders"

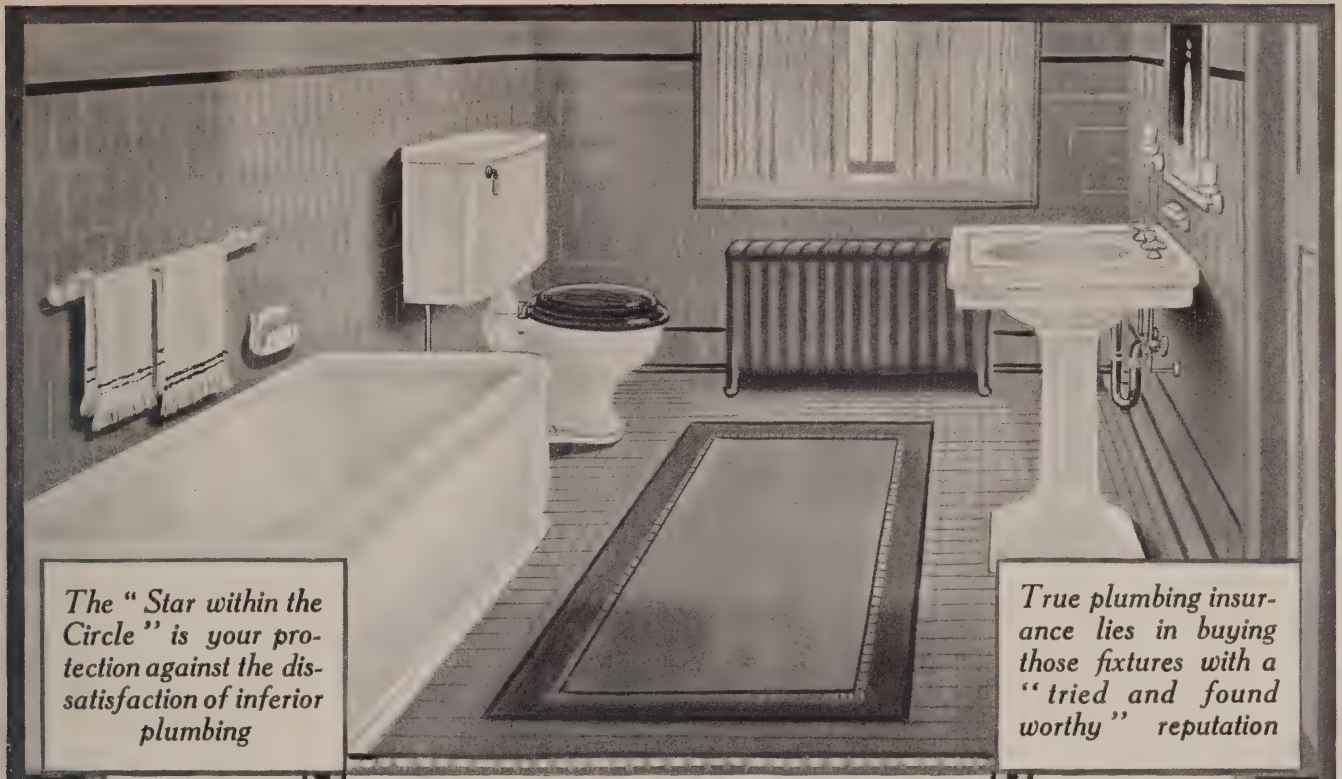
1855

**CRANE CO.**

1917

836 South Michigan Avenue, Chicago





*The "Star within the Circle" is your protection against the dissatisfaction of inferior plumbing*

*True plumbing insurance lies in buying those fixtures with a "tried and found worthy" reputation*

## The Trenton Potteries Company

### "Bathrooms of Character"

*To the uninitiated, plumbing fixtures all look alike — the difference is one of years. Almost any fixture is good for a year or two — but after that you will conclude that the best is none too good.*

Clay products differ. A manufacturer who skimps the baking has a glaze that is soft. We guarantee our ware is subjected to heat of not less than 2,400 degrees — often more. It means the hardest possible surface and the hardest possible ware beneath the surface. It means years of service after poorer made plumbing fixtures are defaced and hammered beyond recognition.

**THE TRENTON POTTERIES COMPANY**  
TRENTON, NEW JERSEY, U. S. A.



## Why You Should Specify KOHLER Sinks

KOHLER Sinks have the same quality distinctions that make KOHLER Bath Tubs and Lavatories first choice for the well planned home.

The designs have hygienic features that are characteristic of all

# KOHLER WARE

*always of one quality—the highest*

*"It's in  
the  
Kohler  
Enamel"*

KOHLER Sinks are made for right and left-hand corners and for open wall spaces.

They have right, left or double sloping drain-boards, and are made with and without aprons.

The whiteness of the enamel is notable in all KOHLER products, each of which has our permanent trade-mark—a guarantee of its high quality.

Architects who Specify KOHLER WARE get no complaints from their clients.

**KOHLER CO.,** *Founded 1873* **Kohler, Wis.**

Boston    New York    Philadelphia    Pittsburgh    Detroit    Chicago    Indianapolis  
St. Paul    St. Louis    Houston    San Francisco    Los Angeles    Seattle    London

★ The KOHLER permanent trade-mark in faint blue appears on the end of sink shown by star.



F-1003-A



# OTIS ELEVATORS



Residence of Frank Williams, New Orleans

Favrot & Livaudais, *Architects*

*Equipped with Otis Automatic Push Button Elevator*

The residence elevator that stops at your door at the push of a button, unlocks the door and takes you down, is no longer regarded as extraordinary so swiftly do we grow accustomed to the advances of science. But in the making of the push-button elevator, as well as in the manufacture of the big office building electric elevators, there has gone the result of years of experience and the best thought of master craftsmen. Otis is the name instinctively associated in your mind with elevator service, because Otis ideas and inventions have so long led. The specification of Otis Elevators is the natural tribute to leadership.

## OTIS ELEVATOR COMPANY

Eleventh Avenue and Twenty-sixth Street, NEW YORK

*Offices in All Principal Cities of the World*



# SEDGWICK



## *When You Want to Buy a Wagon You Don't go to an Automobile Manufacturer*

Similarly, when you have occasion to specify hand-power elevator apparatus, you should naturally turn to a manufacturer who produces only hand-power elevators.

The Sedgwick Machine Works has, for more than a generation, manufactured hand-power elevators and dumbwaiters exclusively, embodying the experience and observation of these years in the correct design and construction of its product.

Full and valuable information on any or all of the popular Sedgwick types supplied to architects at any time.

**SEDGWICK MACHINE WORKS**  
182 Liberty Street New York

## Use Porcelain Sockets in Bath Rooms



In damp places a film of moisture often carries the electric current from the contacts of a socket to the shell, if it is of brass, and any person touching the socket is apt to get a shock. This danger can be avoided by using

### PAISTE Porcelain Sockets

The porcelain is a perfect non-conductor. In many sections of the country only porcelain sockets are permitted in bath rooms, cellars, vaults and other places where there is considerable dampness.

#### DO NOT TARNISH

Paiste Porcelain Sockets do not tarnish when exposed to moisture, and maintain a much better appearance in damp places than brass shell sockets.

Paiste Porcelain Sockets harmonize with glistening white tile and enhance the general effect of brightness and cleanliness.



Send for Catalogue Showing Various Types of Paiste Sockets



**The Hart & Hegeman Mfg. Co.**

346 Capitol Avenue

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## SMYSER-ROYER CO.

### Architectural and Ornamental Metal Work

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FIXTURES A SPECIALTY



No. 220  
Base 2' 0" square  
Height 6' 7 1/2"  
to bottom of center  
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More than 300 models listed in our several catalogues afford a wide range for selection of design and facilitate quick delivery. We also execute with precision and despatch work from special designs.

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# In Behalf of the Architect

A full-page advertisement appears in the September 15th issue of the *Saturday Evening Post*.

This advertisement tells building owners why they should employ an architect to plan their buildings and experts to do their electrical work.

*For more than 30 years, practically from the beginning of the electrical industry,*

## **HABIRSHAW** *"Proven by the test of time"* **Insulated Wire**

*has been accepted as a standard of quality all over the world*

Manufactured by  
THE HABIRSHAW ELECTRIC CABLE CO., INC.  
10 East 43d Street, New York

Distributed by  
**Western Electric Company**  
INCORPORATED  
*Offices in all principal cities*

# Jefferson

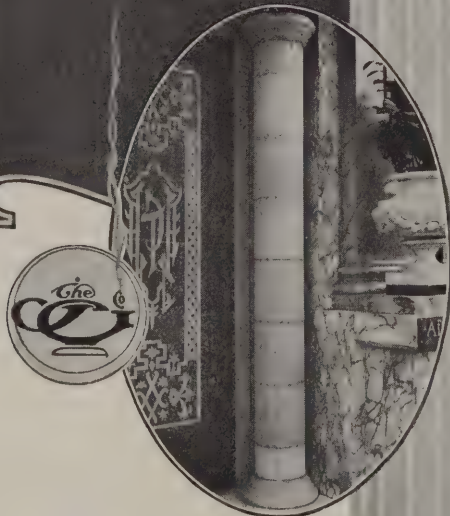
## Illuminated Columns

form a unique though dignified treatment for the entrances to banks hotels office buildings country residences etc.

Heavily moulded from our famous Moonstone Glass these columns are as beautiful by day as they are when aglow at night

*Write us for full information*

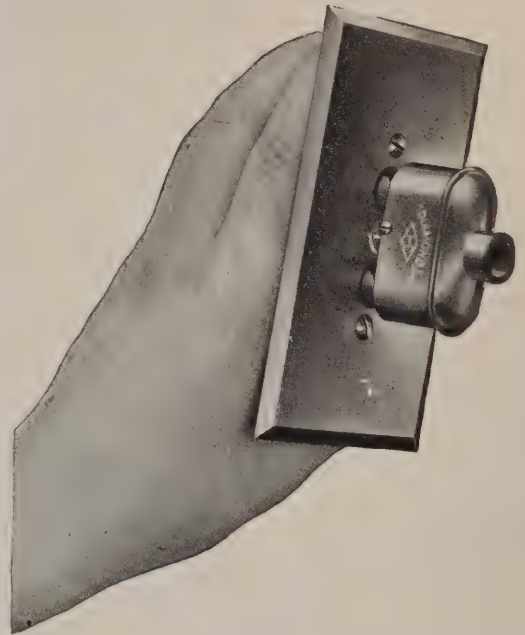
The Jefferson Glass Company  
Follansbee West Virginia



### *Sales Offices*

New York Chicago  
Baltimore Philadelphia  
San Francisco

# SWITCHES



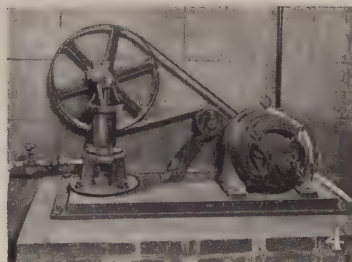
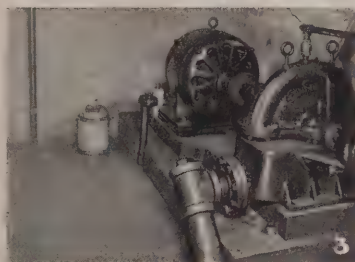
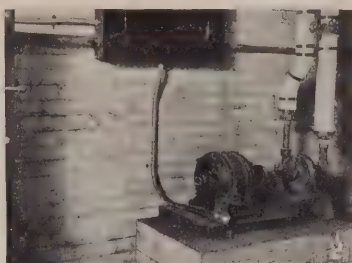
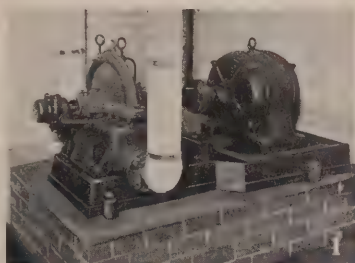
## AN EXTERIOR THAT BESPEAKS QUALITY

The simple, dignified lines and the rich finish of a "Diamond H" Receptacle appeal to the most fastidious taste. Nothing cheap-looking here — nothing conspicuous — but a sturdy simplicity that suggests sound reliability and real service. And "Diamond H" appearances are never deceitful. There are cheaper receptacles made. We could cheapen "Diamond H" Receptacles, if we wished. But — we are possessed of an ideal, viz., to make every "Diamond H" product a standard of quality, not of price.

THE HART  
MANUFACTURING COMPANY  
HARTFORD, CONN.

# RECEPTACLES





THE ABOVE ILLUSTRATION SHOWS FOUR OF THE FIVE GOULDS MOTOR DRIVEN PUMPS INSTALLED IN THE RESIDENCE OF MR. F. A. SEIBERLING, AKRON, OHIO.

Fig. 1, Goulds Fig. 3030 Double Suction Centrifugal Pump which circulates swimming pool water through filter and heater. Fig. 2, Goulds Fig. 3004 which circulates hot water continuously to plumbing fixtures. Fig. 3, Goulds Fig. 3030 Centrifugal Pump which furnishes water to fountains and Japanese gardens. Fig. 4, Goulds Air Compressor used to supply air for water storage pneumatic tank for filter cleaning purposes.

## PUMPS for a \$2,000,000 Residence

In a residence of the high character of that recently completed for Mr. F. A. Seiberling at Akron, Ohio, it is essential to have all equipment of the highest grade. It was for this reason that

**GOULDS PUMPS**  
FOR EVERY SERVICE

were selected for use. Efficient service was demanded and in specifying pumping equipment, the architect, Mr. Charles S. Schneider, realized that high quality Goulds Pumps which are guaranteed to do the work recommended for them would render the service expected by the owner.

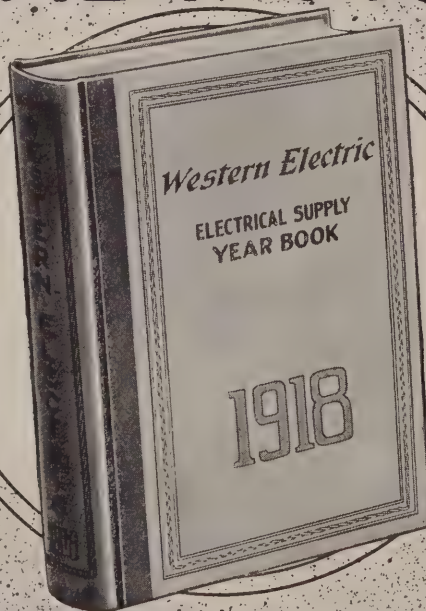
Goulds Pumps are made to meet every pumping need and their installation is a matter of economy which every architect should consider to insure to his client satisfactory service at all times with the minimum of maintenance charges.

**The Goulds Manufacturing Company**  
Main Office and Works, Seneca Falls, N.Y.

Branch Houses: Boston, New York, Philadelphia, Chicago  
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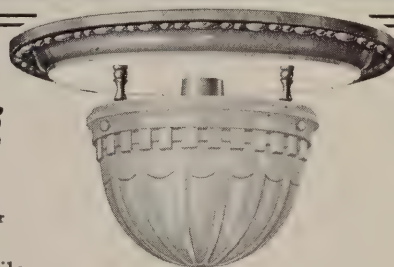
# BRASCOLITE

TRADE MARK REGISTERED

## The Bulletin Building Philadelphia

Edgar V. Fielding, Architect

Henry A. Adams, Constructing Engineer



**T**HIS entire building, recently erected by Philadelphia's leading newspaper, is equipped throughout with Brascolites.

427 Brascolites have been installed to meet the unusually severe requirements of a big, metropolitan newspaper plant.

The selection of Brascolites was made by experts after exhaustive study and competitive tests, because in this fixture were found combined the correct principles of artificial illumination with almost unlimited decorative possibilities. Ample diffusion of light without eye-strain, singular beauty and dignity of design and adaptability to any architectural plan.

In addition to the exceptional efficiency of the Brascolite, its installation means a considerable saving in number of light units and wiring expense as well as in current consumption.

*Write us for photographic reproductions of many kinds of installations, explaining the Brascolite principle and illustrating the infinite variety of designs available*

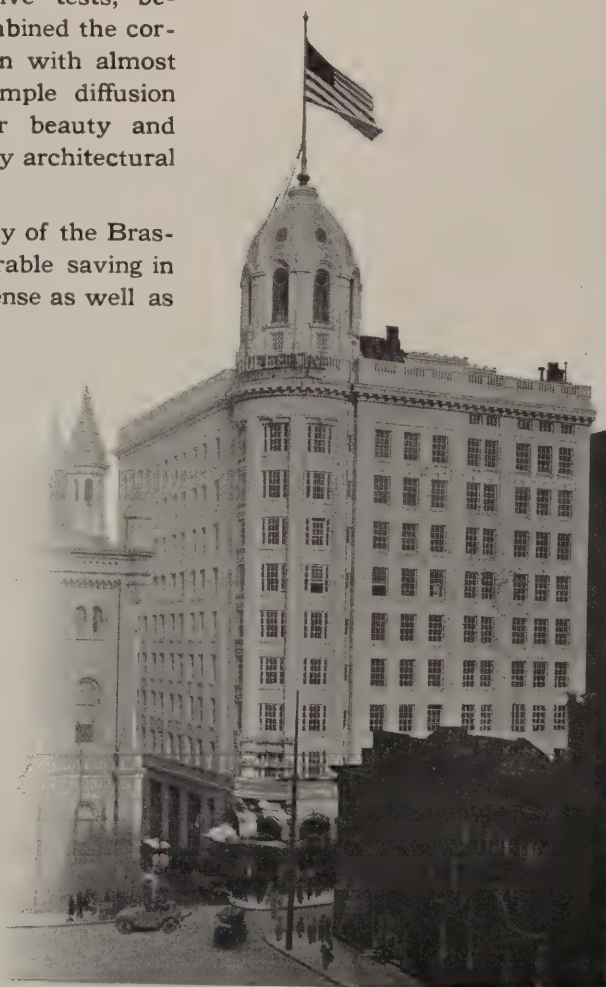
### LUMINOUS UNIT COMPANY

St. Louis, U. S. A.

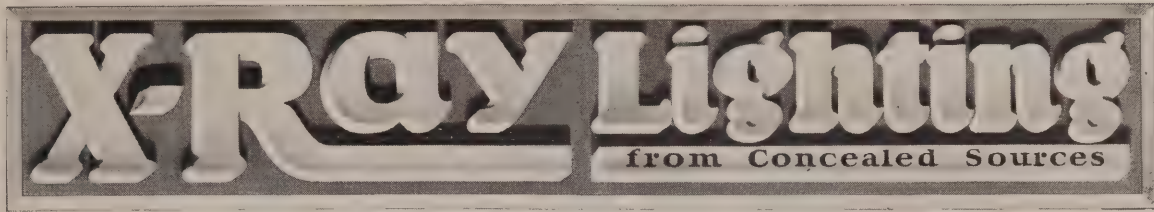
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|----------------------------|--------------------------|
| New York                   | Chicago                  |
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| San Francisco              | Philadelphia             |
| 639 Market Street          | 1007 Land Title Building |
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## FOUR NEW PLATES

### To Help Solve Problems of Illumination

#### *To Architects:*

Furthering our belief in the fact that great advances are being daily made in lighting practice, we announce four new plates of lighting details.

Illustrating, as they do, actual installations supervised by nationally known architects and lighting engineers, these plates are of great practical value. Considered in connection with the many plates previously issued, they prove the versatility in use of X-Ray Lighting.

We believe that thinking archi-

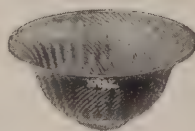
tecs will be particularly interested in those plates which show how deftly architectural treatment can make a beautiful decorative harmony of the lighting, through the use of light from other than ceiling outlets.

To architects who have not yet received them, we shall be glad to send our Book on Lighting (which will be published soon) and the complete set of recent plates. We merely ask, since the preparation-cost of this material is great, that only architects of standing request it.

## NATIONAL X-RAY REFLECTOR CO.

29 West 46th St., New York

243 W. Jackson Blvd., Chicago



# REGENT

SHADES      BOWLS      GLOBES



**"Ivres" Glass**

The Regent Line of illuminating glassware has been greatly enriched by the addition of "Ivres," a warm, ivory-tinted glass with this difference, that the tint is *in* and *of* the glass, not *on* it. Not only is "Ivres" glass furnished in etched designs, as in the illustration, but also in color designs applied by our exclusive "Rozelle" process. "Ivres" deserves more than your casual interest.

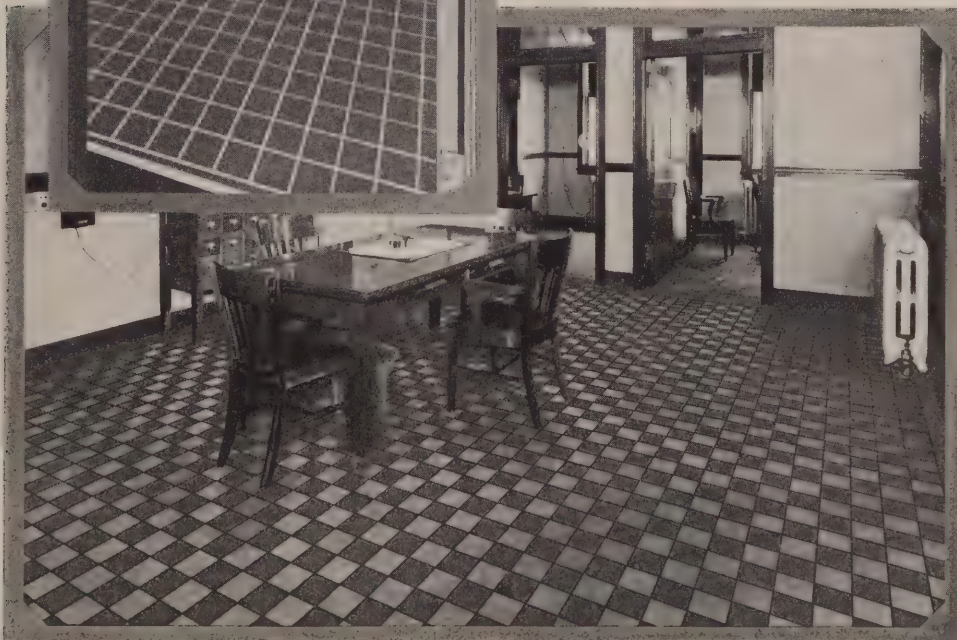
**IVANHOE-REGENT WORKS**  
of General Electric Company  
Cleveland, Ohio

*For all Canadian business refer to Canadian General Electric Co.,  
Limited, Toronto, Ont.*



## Floors that Enhance the Architect's Work in the Medical Office

Linotile floors in the Medical Department of the McCormick Works of the International Harvester Company, Chicago, Ill. The floor shown in the upper illustration, the Nurses' Room, is made up of 4 x 4 inch light gray Linotile with quarter-inch white interlining strips. The floor in the lower picture, the Medical Examination Room, consists of alternate 4 x 4 inch blocks of light and dark green Linotile surrounded by a dark green border.



**P**ROVIDED they do not offend good taste, medical office floors, with a touch of color to relieve the customary severity, heighten the effect of the architect's work.

To obtain such floors and to insure, at the same time, quietness, durability, cleanliness and comfort, discriminating architects employ

## LINOTILE

*"The Floor That's Built to Fit the Room"*

In deft hands, the eleven soft colors provide almost unlimited flexibility in design, while the two shapes in a variety of sizes make possible countless patterns.

Until you have examined a sample, you will have little conception of the excellence of this material, which is a combination of powdered cork, oxidized linseed oil, wood flour, various gums and color pigments.

The samples are sent without cost and, if you desire, a set of specimen specifications will also be included.

### Armstrong Cork & Insulation Company

132 Twenty-fourth  
Street

Pittsburgh  
Pa.





Sunken gardens of  
G. W. Wattles, Hollywood, Cal.

LOOK at Mr. Wattles' gardens. Note the beautiful concrete work. Observe its perfect condition. And mark this—Bay State Coating *made* and *kept* it perfect.

Bay State Brick and Cement Coating takes away the blotchy, blue-gray color of concrete and gives it a glorious, uniform white—the beauty that is its due.

This coating makes walls of brick, concrete or stucco waterproof, wearproof and dustproof.

The four houses shown here are good examples of the Bay Stater's work. They stand inspection.

Bay State Coating is made in pure white and a variety of tints. Write for Booklet No. 10 and a sample of this coating. If you have a color preference, specify the tint you desire.

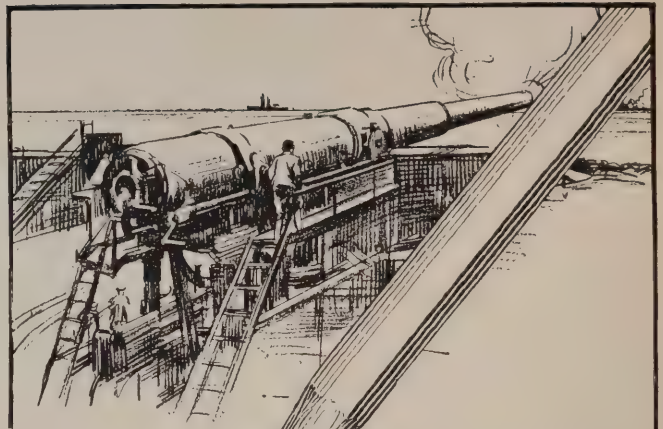


Bay State Cement Crack Filler is the first-aid treatment for walls that crack. It is easily applied and not detectable. Send for a sample.

WADSWORTH, HOWLAND & CO., Inc.  
Paint and Varnish Makers  
Boston, Mass.

New York Office: Architects' Building

**BAY STATE**  
Brick and Cement Coating



## A Pencil Directs Our Coast Defense

Intricate fortification plans and big-gun charts must be drawn with a dependable pencil. The importance of a strong, smooth, long-wearing lead to an engineer can hardly be overestimated.

**DIXON'S  
ELDORADO**  
*"the master drawing pencil"*

has proved itself "*the master drawing pencil*" in every case where it has been used. No work is too hard, no lines too fine, no shading too difficult. If it can be done by pencil, there is one or more of the 17 degrees of the Eldorado that can do it best.

Write us on your letter head for full-length samples of your favorite degrees.

**JOSEPH DIXON CRUCIBLE COMPANY**

Dept. 224-J, Jersey City, N. J.

**DIXON'S BEST WHITE N°352**  
*writes white on blueprints*

DIXON'S "ELDORADO" - the master drawing pencil - HB





## North Carolina Pine

### Saving Money and Adding Art

The modern client, even though he be of moderate means, demands interior features formerly associated only with homes representing considerable outlay. The solution of such problems as this you will find in the use of inexpensive North Carolina Pine.

The beauty of figure and unique susceptibility to stain and enamel, exhibited by this wood, give opportunities for artistic expression found in no other wood of the same price, and in few of those which are far more expensive. As a flooring, either flat or rift-sawn North Carolina Pine proves exceptionally good looking, durable and easily kept in a state of polish. Contractors' Handbook, Book of Interiors and Stained Panels sent on request.

**North Carolina Pine Association**  
83 Bank of Commerce Bldg.  
Norfolk, Va.



**"GOOD OAK FURNITURE IS MORE NEARLY 'BOY-PROOF' than any other equally fine cabinet wood."**

Its elegance, dignity and artistic adaptability are backed by its sturdy resistance to dents and scratches. (A quite important point.)

"There is no finer heirloom than good OAK furniture." No more *safe* and *enduring* investment. (This is a fact, isn't it?) Why shouldn't your clients do some insisting—when necessary?

**THE AMERICAN OAK MANUFACTURERS' ASS'N.**  
know about OAK. Ask them any sort of question. Ask them for literature. Write for **FINISHED SAMPLES, FREE.** Please address  
Room 1402, 14 Main Street                      Memphis, Tenn.

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OWN CEMENT STONE BY

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From originals designed and carved in the earlier centuries provide the one feature of interior decoration that is most valued by the residence owner of discriminating mind.

They afford the right frame for the cheery Spring and Fall fire-log, coal grate or gas-log.

Hotels, theatres, club houses and public buildings are likewise enhanced in beauty by Jacobson reproductions.

Write us concerning your plans. From our many plates you can select the antique design best suited to any room interior.

Our designing staff is at your service.

Our studios are always open to architects and others interested in chimneypieces, ceilings of distinctive patterns and interior ornamental art work in stone or plaster.

## JACOBSON & COMPANY

*Designers, Modelers and Plasterers*

241 East 44th Street      -      New York, N. Y.





*Matinecock Neighborhood House. Guy Lowell, Architect, N. Y. Walls finished with Old Virginia White. Roofs stained with Cabot's Creosote Stain*

## Cabot's Old Virginia White

The Modern Architectural Outside White

The clean, brilliant "whitewash white" effect of Old Virginia White has real distinction. It is a softer and yet a brighter white than paint, and its texture and color-values are essentially different in character from the heavy, hard paint coating. This makes it especially appropriate for the modern "Colonial," because it gives the house at once the aspect of well-groomed old age—a result that it would take years to accomplish with paint.

## Cabot's Old Virginia Tints

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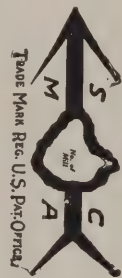
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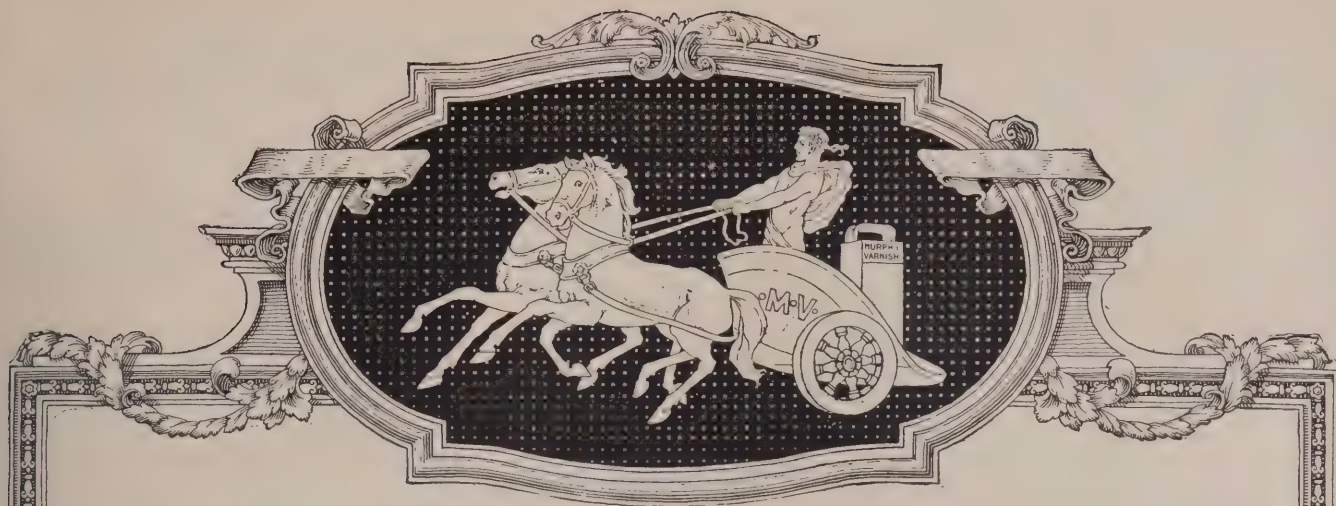
OSHKOSH, WISCONSIN

*—and so  
is this  
little house*

*(in Michigan)*



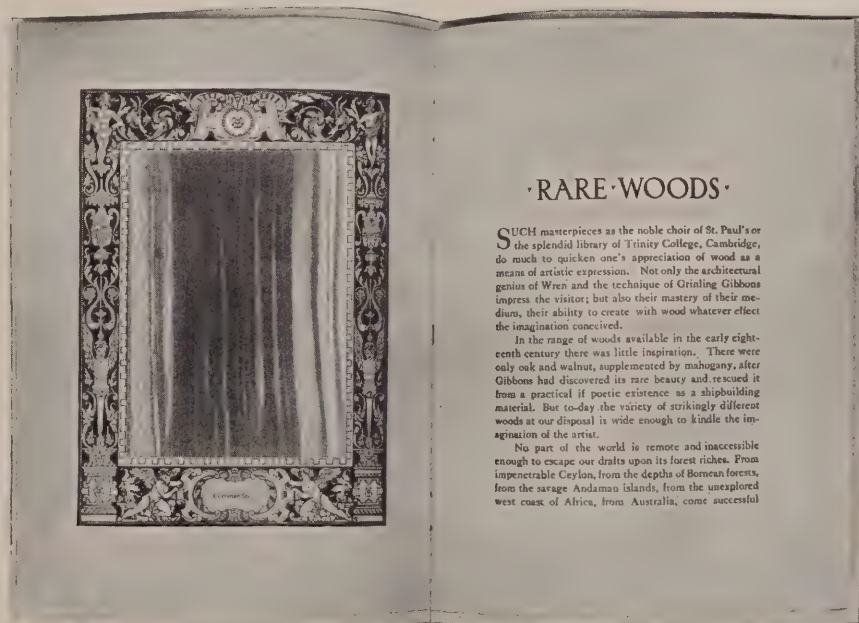




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In the belief that architects share our enthusiasm for beautiful woods, we will send them one copy each on request. Owing to its costliness our distribution of this publication must be limited to architects.

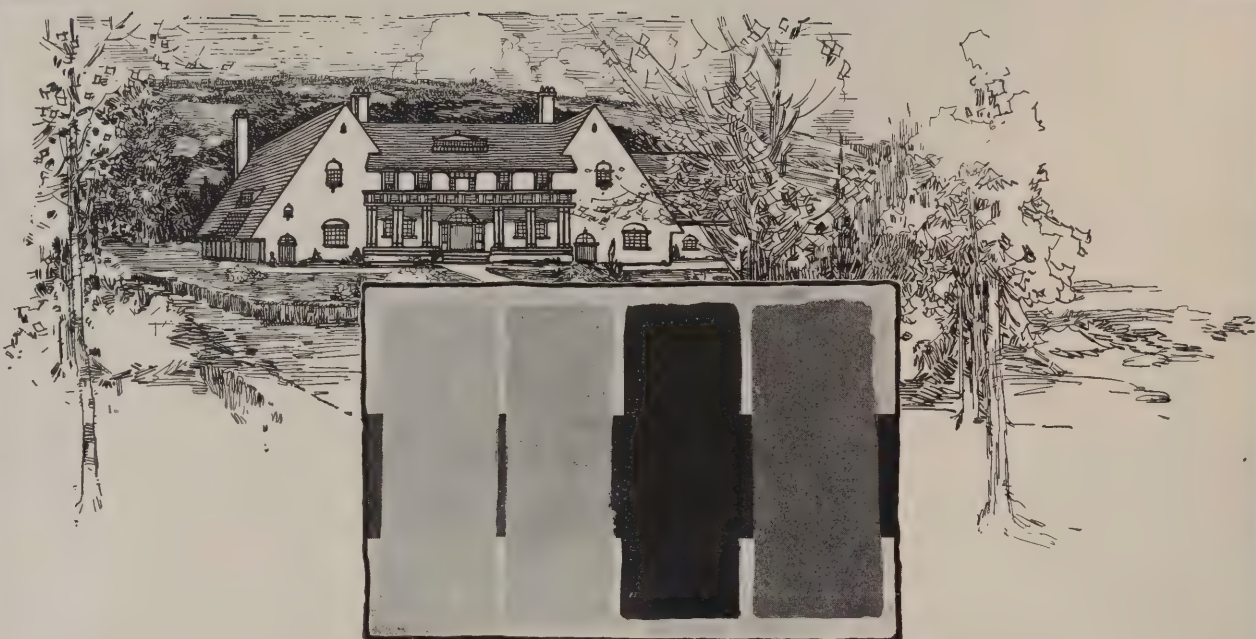
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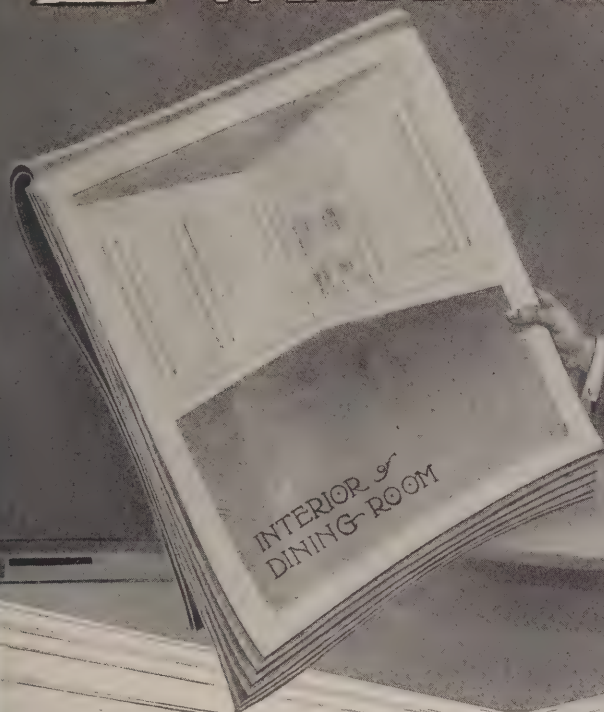
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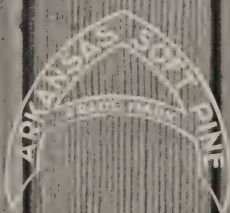
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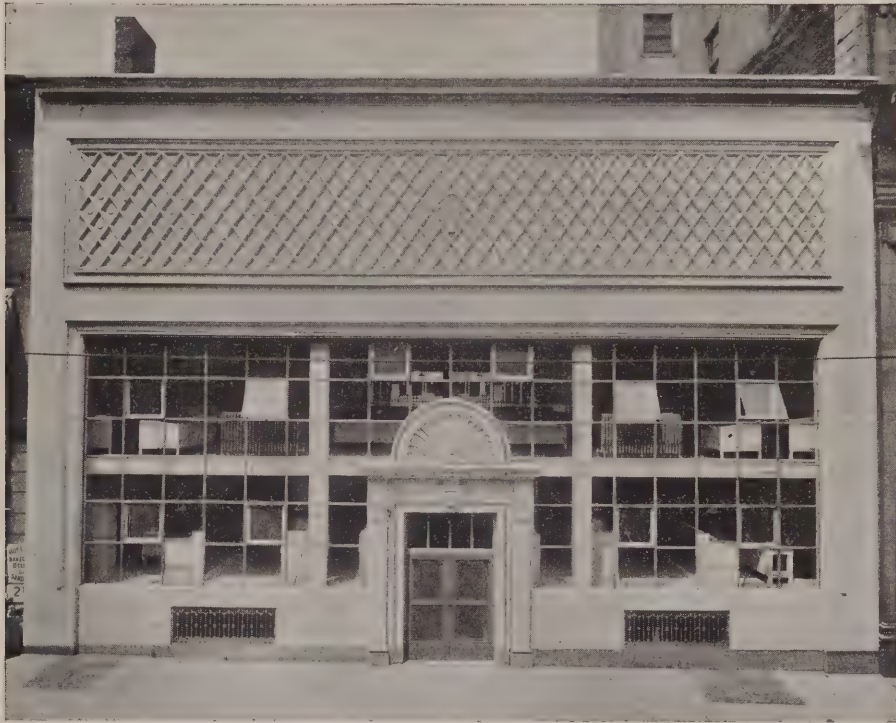
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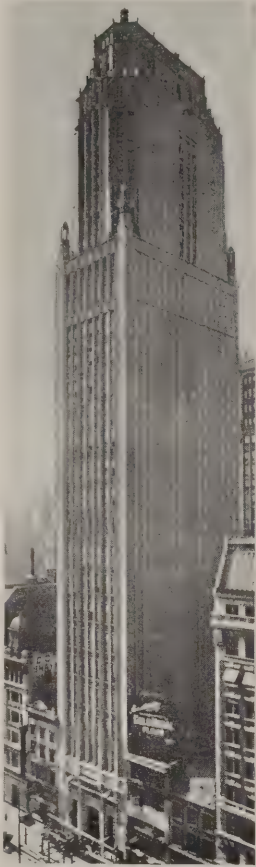
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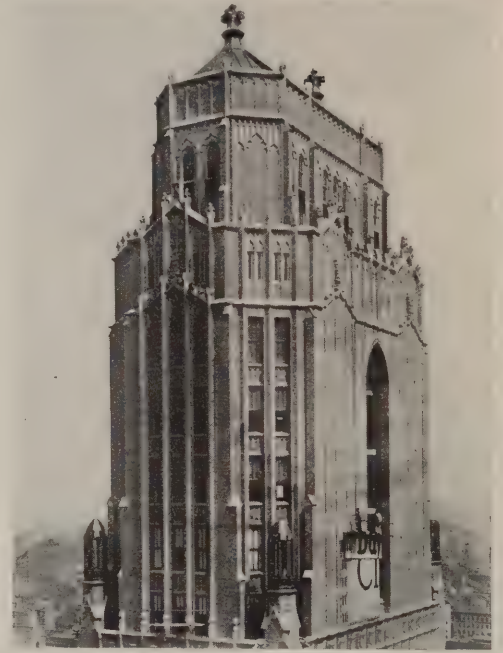
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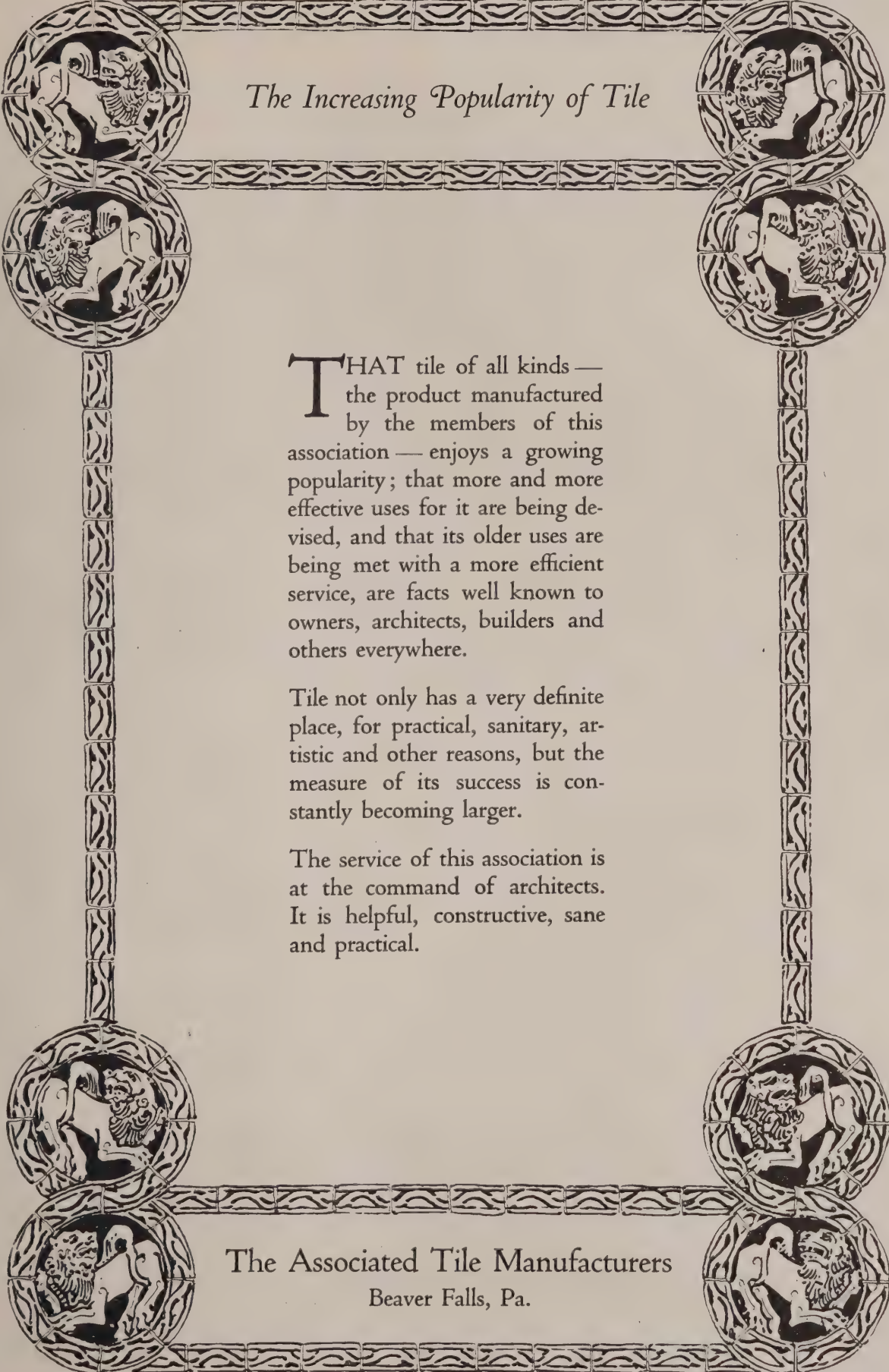
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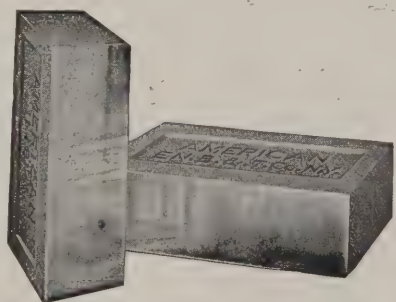
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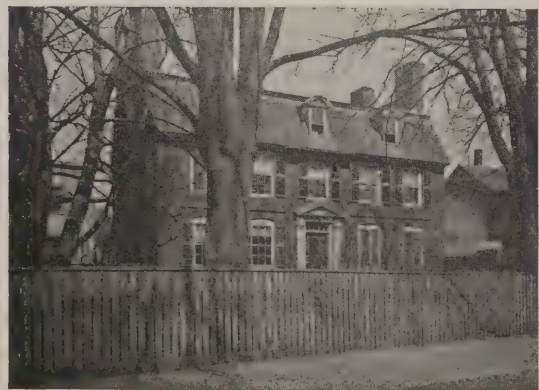
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A large proportion of the cuts in this book consists of absolutely new material, for they show the Italian country estate of the Renaissance in all its parts,—house, garden, terracing, and the outlying *podere* or farm as well,—for it is in these smaller buildings, scattered in picturesque sites, always skilfully adapted to the surrounding landscape, that we find many admirable examples of small house architecture.

Though this book consists largely of photographs and sketches of little known villas, it contains, none the less, views and plans of some of the better known and frequently published ones, for it is believed that it will then make the best sort of reference book for the architect, and provide the best sort of inspiration for all those who have felt the enchantment of life on a country estate.

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# THE ARCHITECTURAL FORUM

VOLUME XXVII

NUMBER 4

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LOGGIA DEI MERCANTI, SIENA, ITALY

DESIGNED BY SANO DI MATTEO



# THE ARCHITECTURAL FORUM

## FOR QUARTER CENTURY THE BRICKBUILDER

VOLUME XXVII

OCTOBER 1917

NUMBER 4

### Recent Hospitals for the Navy

By F. W. SOUTHWORTH  
*Architect, Bureau Yards and Docks, Navy Department*

NAVAL hospitals have been built recently for the Bureau of Medicine and Surgery, Navy Department, at Chelsea, Mass., Portsmouth, N. H., and Newport, R. I. The plans and specifications were prepared by the Bureau of Yards and Docks and the construction was under its supervision also. The buildings at the three stations are practically identical and typify the latest development in Naval Hospital construction. The demands of naval and civil hospitals differ little except, perhaps, in administration, and in accommodation of patients. In naval hospitals less space is required for executive, emergency and dispensary work and fewer private rooms and suites are needed. The buildings were designed with especial attention to economy of service both for the present needs and for possible future extension. The complete layout provides for four additional ward buildings without change in administration or subsistence buildings. Each ward is designed for a normal capacity of thirty beds, the number of patients found by Navy experience to be the most economically cared for in one room. The number of beds in a ward can be increased by fifty per cent if occasion demands.

The buildings are constructed of brick in nine shades with an interior lining of hollow bricks. Sills and key-stones are of granite, and terra cotta in granite shades is used for belt courses, pilaster caps, and similar trim. Partitions are, in general, 4-inch terra cotta with hard plaster finish. Floors are of reinforced concrete supported by fire-proofed steel construction. The roof covering is slate on wood sheathing carried on steel trusses.

Each hospital group has an administration building, three stories and basement in height, with a two-story and basement ward building on either side. An operating and subsistence building is in the rear of the main buildings and is joined to them by means of corridors and solaria.

The buildings are connected on every floor. Each hospital cares for 134 patients normally, but in an emergency would easily accommodate 175 without encroaching upon corridor or solarium space.

Offices for commanding and executive officers are along the front of the first story of the administration building near the first-story wards and elevator, easily supervising the main hospital life. Administrative offices, laboratories, rooms for examination of patients for eye, ear, and throat treatment, and for dispensary work are arranged to facilitate action and avoid unnecessary waiting. The main entrance for patients is through the hall of the administration building but an ambulance entrance is provided in the rear of the administration building opening directly to the elevator. The hospital buildings are provided with ample solarium space, each ward having a large glazed enclosure at its end. Loggias are provided between administration building and wards and the octagonal solarium between the administration building and operating and subsistence building has a partially covered roof garden. The tiled solarium roof is accessible to wheel-chair patients, the elevator running to the solarium roof level. Rooms for hydriatics are located in the basement of one of the wards, with adjacent lounging and rest space.

All kitchen service and supplies go to the rear of the buildings without interfering with patients or visitors entering at the front of the building. The main kitchen is on the ground floor of the operating and subsistence building, and food is carried on wheel trucks to dumbwaiters leading to various diet kitchens on the different floors. Diet kitchens with tile floors are provided with electric stoves. Cleaning gear rooms with tile floors are on each floor of administration building, and in each ward for necessary brooms, mops, etc. Soiled linen is taken from the wards in sterilized canvas bags and dropped through chutes



View of One of the Three New Hospitals for New England (Chelsea, Mass.)

to the basement where an outside door is provided from which the linen is carried directly to the disinfector before going to the laundry. The mortuary and autopsy rooms are located at the extreme end of one of the ward basements with direct outside communication. The photography room has been protected from the X-Ray room, which comes next to it, by means of sheet lead stretched on the wall back of the plaster furring.

Several details of construction have been used in the hospitals that are considered especially good and practicable. Cast iron bases and plinths, 6 inches high, with a 2-inch cove at base flush with floors have been installed throughout the buildings except for the main hall of administration building, and except for tile floors, where wood base and tile base have been used respectively. The cast iron base is secured to the wall by means of clips and is grouted and filled in with cement behind the metal so that the metal base becomes practically integral with the wall. The plaster finish is brought down flush, with the base butting against it. Closet floors are raised 6 inches above room or corridor floors in order that the cast iron base may run across the front of the closets, doing away with cracks and corners at the floor level. This construction also makes it easier to clean and sweep out the closets. Simple window trim has been used without moulds and the section of muntins, rails, and stiles for sashes are without fillets. The feather edge that is unavoidable in the use of a curved section and the omission of the fillets, is taken care of by putting in and varnish. In the actual work the feather edges have come out well and are not impracticable, although the section adds to the expense of the work and is disliked by carpenters on account of the extra care necessary to insure good work.

Except for basements and operating suites, and excepting a few instances in the main hall of the

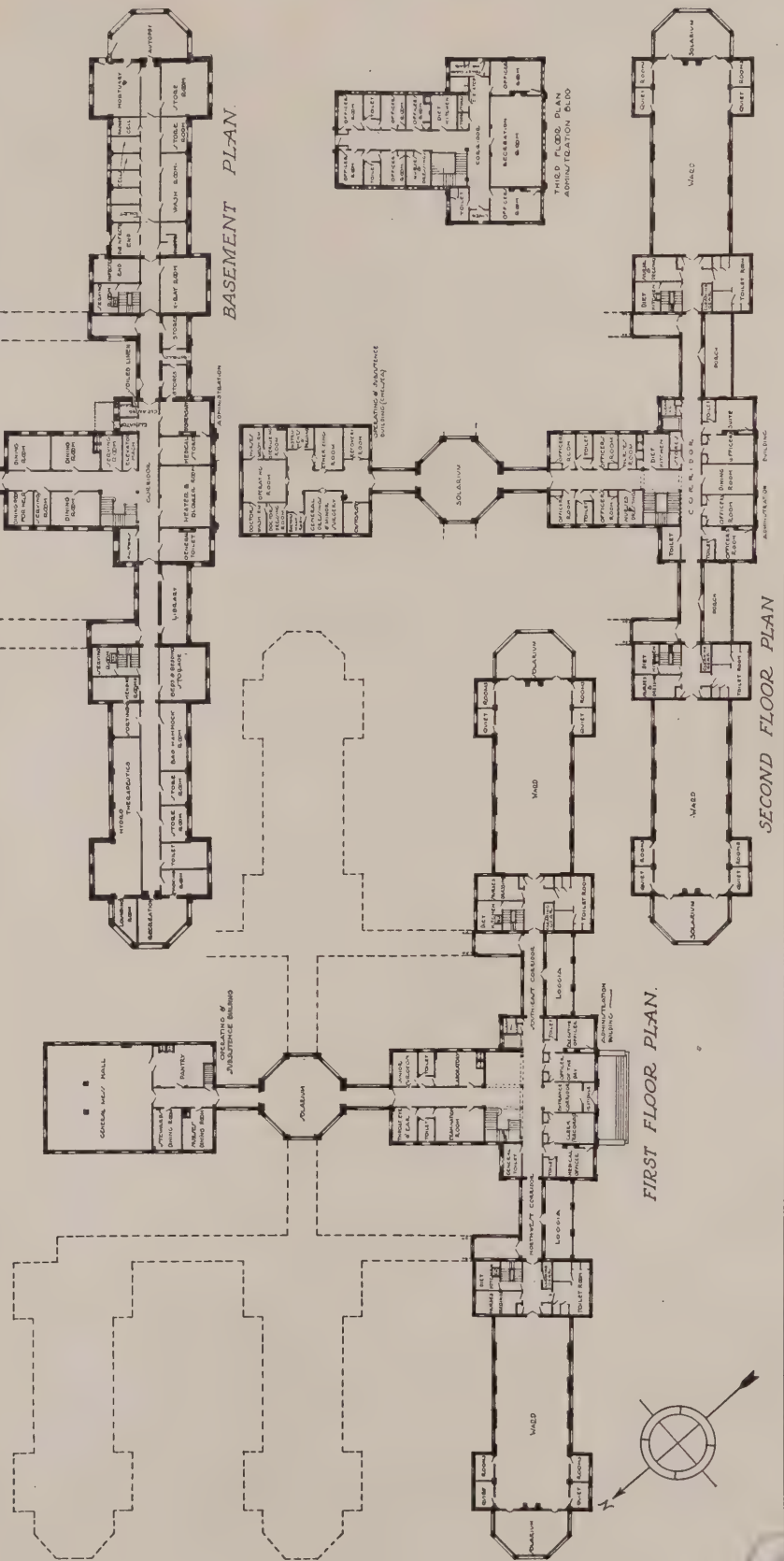
administration building, flush surface wood doors have been used throughout. The doors are a compound, veneered type with birch exposed veneer. The finish is varnish leaving the natural coloring of the wood visible. The trim in general is finished "natural." White painted trim is used only in the operating suite and in toilets and dressing rooms. Basement doors are a stock five paneled pattern. Operating suite doors and all toilet enclosure doors are metal, enameled white, with simple moulds.

The ideal hospital floor is a composition floor, but up to the present time, composition floors at a reasonable price have not proved entirely satisfactory. There are still a few practical points to be overcome, such as cracking, roughness and unevenness of surface, separating from the material on which they are placed, discoloration and decomposition where much water is used. The composition floor would be ideal in that the flooring itself could be carried up 6 inches or more on walls with a coved base. This has been done but has not been successful enough to warrant the chance of ruining large amounts of work. A good floor for wards and patients' rooms is linoleum cemented to a concrete base. Linoleum is easy to walk on, quiet, and clean. Linoleum has been used very successfully abroad where labor conditions are different from the conditions existing in this country. It is extremely difficult, and at times almost impossible, to get labor careful enough to install work of this description. For a successful floor, linoleum should be carefully laid on and cemented to a "builders felt" base approximately one-sixteenth of an inch thick. The felt is laid in cement on the floor. A special cement or glue is prepared for laying linoleum. The felt base not only allows a certain amount of expansion and contraction but also allows the linoleum to be taken up and replaced with little



FLOOR PLANS OF NAVAL HOSPITALS  
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NAVY DEPARTMENT, U. S. A.  
AT CHELSEA, MASS., PORTSMOUTH, N. H.,  
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effort. Linoleum should be warm when laid to prevent cracking. Linoleum can be carried to a base board with a small scotia or quarter round tacked down on it, or it can be carried up on walls. When linoleum is carried up on walls the edge should be held in place by brass strips secured to the walls and bent to form a ground for plaster, if plaster is used above the linoleum.

Terrazzo has received a great deal of attention and has a great many enthusiastic supporters for flooring use. This is another material that has been more successfully used abroad, especially in German hospitals, than it has been used here. In addition to the cracking to which terrazzo is subject, the terrazzo is noisy and is hard to walk on. Circular ceramic tile has been used for ward floors in certain New York hospitals. The flooring looks attractive at first, but the amount of cement mortar in proportion to the tile is large and has in places worn into dust. It is easily eaten out by acids, and the small tiles break and chip. One advantage of the terrazzo or tile floor is that, if required, the floors can be thoroughly flushed without injuring the flooring material. The floors of the recently constructed naval hospital buildings in North Chicago are of compressed cement tile about six inches square. So far the tiles have given fair satisfaction, but they are expensive, have crazed and have the disadvantage that without constant care they are likely to wear up into a fine dust. After investigating the question of floors very carefully, hard pine, quarter-sawed, heart-stuff flooring was used in the majority of the rooms of the three New England hospitals referred to. The floors, after several waxings, become practically impervious. For kitchens, bath rooms, diet kitchens, and toilets, a hexagonal three-inch vitreous white tile has been used. The vitreous tiles are impervious and when laid properly and evenly with a white cement joint are not only attractive but practicable. The disadvantage in the white vitreous tile is that it needs frequent cleaning even if the tile is properly rubbed down and smoothed off when laid. The operating rooms are floored with Tennessee marble tiles approximately eight by twelve inches in size. Tennessee marble is used on account of its being practically impervious and slow in action under acids. The vitreous tile might have been used in the flooring of the operating rooms but the number of joints are excessive in proportion to the floor area. The tributary rooms in the operating suite are floored with the white vitreous tile, the same as used in baths. Expense prohibited the use of marble tiles in all of the operating

suite. Glass floor tiles have been tried in several hospitals for the operating rooms but the glass chips and spalls very easily with any settlement. White marble has been used in a number of civil hospitals for flooring but it is easily acted upon by acids and soon shows wear.

In general, wall surfaces have been plastered. Hard plaster has been used for walls, above basement. All interior angles are coved and all exterior angles are "bullnozed." The walls in wards are painted with a sanitary paint. Tennessee marble wainscot, 7 feet high, with coved base and flush with the plaster has been used in the operating rooms. This was successfully installed with ground joints without mortar. Basement walls are a buff face brick in corridors, kitchen, and rooms other than store rooms.

Hardware throughout the hospital buildings is of a substantial, heavy type, free from ornamentation. It is "solid cast polished bronze natural finish." The hardware will stand constant polishing without changing color or texture, although polishing is not necessary. Window sashes in wards and in rooms occupied by patients are fastened by means of cinch fasts in addition to the ordinary sash fasts on the meeting rails. All doors in operating suites are furnished with dust-proof roses, dust-proof strikes, and keyhole traps. The traps consist of flaps on springs which keep the keyhole closed unless a key is in the lock. That is, the keyhole plate presents a flush surface with no opening apparent when the key is not in use. The same idea is applied to the strikes, keeping the strike as a surface flush with the door jambs when the door is open.

Electrical fixtures throughout the hospital buildings are of the simplest possible design equipped with prismatic extensive or intensive globes, according to the position of the fixture. The canopies are of special design, easily removable and allowing the goose neck or bracket to be kept closely to the wall, considerably closer than most of the commercial fixtures. The operating room lights over tables are in a group of five, so arranged that no shadow is cast on the table. Each light is of 80 candle power and is controlled by a separate switch so there is no difficulty in controlling the amount of light. The shades of the lights over operating tables are spherical and easily cleaned. Dimmer appliances are used where required.

The plumbing layout designed for the hospitals is simple and the fixtures are the best and of the latest design. Where urinals occur, enameled iron tanks have been used with stayed chain pulls.



For water closets, vitreous bowls and low down vitreous tanks have been used. The tanks are large and insure quick and efficient flushing of the bowls. The tanks are covered with simple porcelain lids which are bolted or fastened in place so that they cannot be lifted without the use of proper tools and time. This obviates the probability of the tank lid being raised by any one other than the plumber. The lever arm for flushing the bowl is of such design that it can be readily repaired if injured. Bath Tubs for private use of officers and for use of patients who are convalescent and well enough to take their baths without assistance are of the corner pattern, let into walls and floor so that only two sides of the tub are exposed, and so that there is no chance for the accumulation of dust, dirt, and moisture back of the tub. Where tubs are installed in the general baths of the wards, and where the baths of the patients must be given by the nurses, the tubs are so placed that a nurse can be stationed on either side of the tub. Lavatories and sinks for use in operating suites are equipped with rose sprays, deep bowls, and knee control. Vitreous ware is used in all fixtures where the size will permit. The fittings for all plumbing fixtures, including standards for water closet and bath enclosures, are of "red metal." Red metal is a composition of copper and tin containing not less than 80 per cent of copper and 7 per cent tin. The composition of the red metal is such that it will stand indefinite polishing without change of

color. The hardware and plumbing fittings are practically the same in color. Nickel plating looks very well when it is properly cared for and only wiped off as required, but the tendency in most institutions is to polish the metal infrequently and then so severely that the nickel plating soon wears off exposing in places the brass or copper on which the plating is made. Shower baths are provided of simple design and of such construction that the mixing of hot and cold water is simple and so that scalding is possible only through deliberate attempt.

The buildings are heated by plenum and exhaust systems to insure proper ventilation and an even temperature is maintained by the use of direct heat from hot water radiators. For the operating suite the air is washed to prevent dust particles from entering and then re-heated. The air for the operating suite can be maintained at the required degree of heat and humidity.

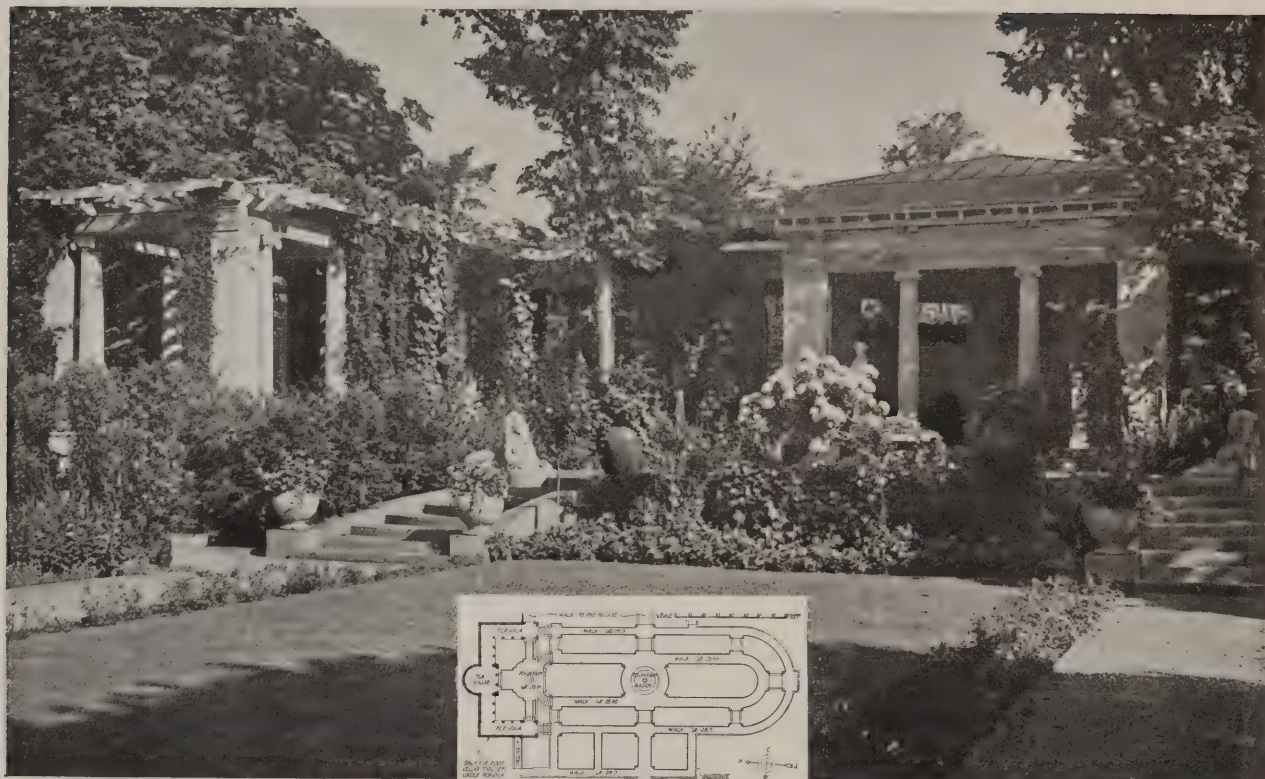
Radiators for the hot water heating system are of a hospital pattern, free from ornamentation and having sections about three and a half inches on centers. The radiators are all set out free from the walls and can readily be cleaned. In the operating rooms the radiators are set up on platforms two inches above the main floor to allow for flushing the floor without danger of water running down the heating pipes to the floor below.

All buildings are supplied with vacuum cleaning outlets. The apparatus, including an automatic wet tank separator, is placed in the basement.



View of Operating and Subsistence Building, with Solarium in Rear of Main Group (Chelsea, Mass.)





GARDEN ON ESTATE OF EDWARD S. HARKNESS, ESQ., NEW LONDON, CONN.  
JAMES GAMBLE ROGERS, ARCHITECT



# The Dome of the Panthéon, Paris

## A STUDY OF ITS STRUCTURAL SYSTEM

By RICHARD F. BACH

Curator, School of Architecture, Columbia University

**S**MALLER in diameter by nearly half, but not in any sense less impressive in design than any of the examples thus far analyzed in this series of studies\* of domical structural systems, is the dome of the Panthéon in Paris, constructionally the most interesting, architecturally the most effective dome in France, and the finest French church of the eighteenth century.

Like almost all the larger church buildings in Europe the Panthéon was erected to supersede an ancient building of inadequate size and of supposedly antiquated style. The new building is said to have been vowed by Louis XV during an illness at Metz and to have been begun in 1755 or 1757, according to various accounts, although the actual laying of the first stone of the high altar did not occur until 1764, under direction of Jacques Germain Soufflot (1714-80), whose designs were granted the award in open competition. Soufflot had recently returned from an extensive tour of Italy as mentor of the Marquis of Marigny, brother of the courtesan Pompadour and destined by her to occupy the eminent position of surveyor general of public works once held by no less a figure than Colbert. His mind was filled with the classic reactionary feeling, in which the Pompadour herself later abetted him, thus laying the surest foundations for the type of purism usually identified with Louis XVI's time. Soufflot's design was as a firebrand in the camp of the looser style interpreters that hedged about Louis XV. His columnar portico and pediment, his expressive blank wall areas, and, above all, his finely monumental design for dome and drum with peristyle accomplished a revolution in the current architectural manner. It is interesting to note that the style of the building was then called Greek, a building manner at that time known as *le bon goust*.

The church was not completed when the uprising of 1790 opened the eyes of the masses to their own possibilities, and the resulting wave of republican fervor caused a change from the original dedication of the building to the patron saint of Paris, Sainte Geneviève, to the then applicable name of *le Panthéon français*, necessitating a

number of changes in decorative features of the building, largely undertaken under the direction of Quatremère de Quincy. In 1806 the building was rededicated to Sainte Geneviève, only to be called a temple again in 1830; in 1851 it became a church once more and, finally, in 1885, was *désaffecté du culte* for the last time when Victor Hugo was interred in the crypt. Since that time it has more and more decidedly assimilated the character of a true Valhalla, more true to its rôle than St. Denis or Westminster Abbey ever was; it is not a little remarkable that a church edifice should so decidedly lend itself to a purpose differing thus widely from that which prompted its erection; but the adaptability of the Panthéon as a memorial edifice is due no doubt to the type of its design, and more particularly to the treatment of the dome and its substructure, not to mention the giant portico, inspired—as were the domes of St. Peter's and of St. Paul's—directly from the ancient example of the original Panthéon, namely that of Hadrian in the Imperial City. In fact, Soufflot set himself the task of adapting the Roman Pantheon motive of dome and portico and elevating the former to the proportions of St. Peter's, so that he might surely overshadow the Dôme des Invalides, built 1680 to 1706.

Various architects were employed from time to time after Soufflot and Quatremère de Quincy; viz., Francois le Romain, Viel de St. Maur, Peyre, and Rondelet, the last named having been especially concerned with the completion of and the improvements subsequently necessary in the dome, the design of which was attacked before its completion by no less an authority than Patte, who was jeered into silence, but not before he had embittered the last years of the architect's life.

## II

Soufflot's scheme involved a Greek cross plan, with the major dome at the crossing 265 feet high, and a minor segmental dome over each arm, the smaller domes not expressed in the exterior. A fine Corinthian order is used to separate the aisles from the nave, and the aisles are returned across the ends of the transept arms. At the crossing, however, the columns form the outer angles of triangular piers that serve as the main support of the major dome. The other two angles

\*Dome of S. Maria del Fiore, Florence. THE BRICKVILDER, August, 1916, pp. 209-215. Dome of St. Peter's, Rome. THE BRICKVILDER, October, 1916, pp. 249-254. Dome of St. Paul's, London. THE BRICKVILDER, November, 1916, pp. 275-280.

of each of these piers are made by allowing the pier to project forward the distance of an additional intercolumniation into both nave and transept. To disguise the poor effect of these projections, necessarily of solid masonry because of their relatively small size with reference to the work of support expected of them, the suggestion of a second aisle is achieved by placing in line with the outer points of the piers a second row of columns, in which the two central columns on each side of each arm of the Greek cross have been omitted. By this means each of the arms is itself made to appear as a short armed Greek cross, the interior effect being obtained by springing deep semicircular arches, or vaults with narrow soffits, over the space of three intercolumniations lengthwise of the arms of the plan obtained by omitting the two middle columns of the suggested inner aisle. A shallow saucer dome then appears over the remaining open space in each arm of the building, receiving its direct support from slender pendentives rising above the added

columns just referred to, and so thin in actual construction as to recall the web of a Gothic vault.

Similar arches were also thrown across nave and transepts, and these together with the inner pier faces form the basic octagon of support for the dome, the octagon in turn being further modified to circular form by the use of pendentives over the piers. The pendentives, decorated by Carvalho's paintings after Gérard, complete the circle with the aid of a heavy entablature which forms the lower line of the drum on the interior.

The plan in print does not adequately convey the manner in which these elements have been made ingeniously to abet one another, and sections on several intersecting planes are necessary to suggest the structural expedients adopted throughout; but while the scheme is praiseworthy, perhaps, as a clever contrivance, the fact remains that the large open space at the crossing was purchased at the expense of the nave and transepts. Justly so, according to some critics, yet we are apt to prefer a more expansive ap-

proach to so important a feature as the crowning dome is made to be, and as any crowning dome in modern architecture, placed in the plan as this one is, must be. Too often one meets this difficulty of bringing into harmony the long nave barrel vault or its corresponding feature and the sudden change to the vertical as one is forced to gaze upward into the hollow cylinder of the drum, which in turn so readily depreciates the value of the interior dome and its decorations. The eye seems to require a more definite foretaste of what is to be seen at the crossing, and this is to be obtained only by a broader treatment of the nave and transept approaches.

Restricting ourselves now to the central portion of the building, we note that the drum rises above the entablature that forms its immediate base, as a true hollow cylinder, without diminution, as at St. Paul's. Its wall is pierced by twelve square headed windows, set about halfway in its inner height, while recesses of equal size are built in above the piers. Between windows and recesses appear sixteen engaged Corinthian columns, set at a level lower than the sills of the windows by



Panthéon, Paris. View of the Main Facade



about the height of its entablature, and higher than the base of the drum by approximately twice this height. The entablature of this order forms the springing of the dome visible from within.

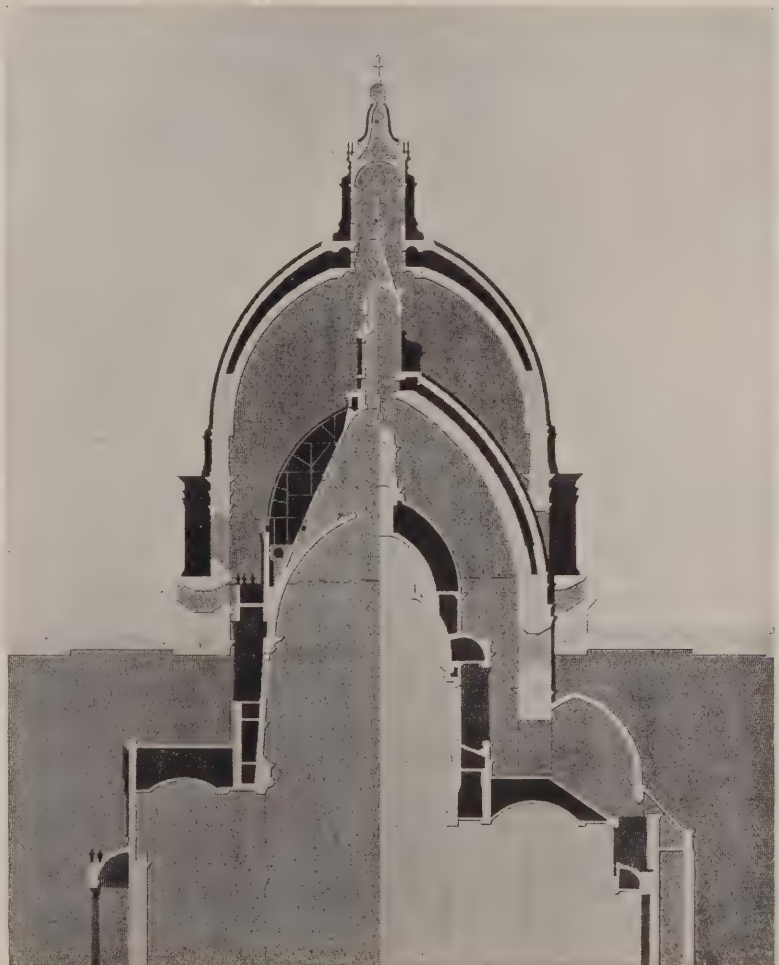
As in St. Paul's, the example which Soufflot seems to have used freely as an inspiration, the drum is really composed of a double wall, its two faces anchored together at various levels for structural purposes, but actually built without definite reference to one another except at the window level. Thus in the exterior the drum rests directly upon an octagon of masonry seen above the roof of nave and transepts, representing the solidity of understructure that the eye demands and, according to the records, suggesting a possible original intention of making the entire exterior support of the dome of square plan. Above the octagon appears a circular wall, and upon this is erected the effective exterior peristyle of thirty-two Corinthian columns screening the windows; the entablature of this order is surmounted by a balustrade behind which is a shed roof covering the space between the two walls of the drum. Above this the inner drum continues as an attic wall, varied architecturally by round headed windows set in shallow rectangular recesses, and above the attic wall rises the exterior dome. Several floors of masonry at levels above and below the exterior order, which is of the same height as that on the interior wall, but is set higher by about one-fourth the height of its shaft, break up the vertical space between the two walls of the drum. These floors serve, of course, the structural purpose of binding the two walls together—a necessary expedient because of their entirely distinct systems of support. The necessary light for these passages is obtained by means of a row of rectangular openings set beneath the windows and cut into the stylobate of the inner order, by another row of very small apertures immediately above the entablature of the outer order, and by a third row let into the exterior wall of the drum just below the peristyle.

It should be noted at this point that the two walls of the drum rise from independent supports. While the inner engaged order and the

walls below and above rest directly upon the piers, cross arches, and pendentives, the wide soffits of the arches are structurally egregious deceptions. Their effective strength for support appears and is relied upon only at the edges toward the crossing. The remainder of the broad soffit areas are of thin masonry with a hollow space above. The actual support for the outer peristyle and the rectangular mass beneath it must be sought in constructive expedients once more: four giant arches, with diagonal spur walls, erected as part of the fabric above the outer edges of the broad arches mentioned above, which, optically at least, seem adequate for supporting the whole drum. These four invisible arches are segmental in form and span the entire width of the building at the crossing.

### III

The dome itself is composed of three shells, following the unexecuted suggestions made by Michelangelo for St. Peter's, and likewise the method of Sir Christopher Wren in the execution



Comparative Sections of Domes of the Panthéon, Paris; St. Paul's, London; Cathedral of Florence and St. Peter's, Rome. (From Dugdale)

of St. Paul's. However, two of Soufflot's shells are of stone, as is also the lantern, and all of the shells are of sections composed of arcs of circles.

The innermost shell is hemispherical and rises directly from the entablature of the inner order of the drum, its thickness diminishing slightly upward. Its surface is decorated with octagonal coffers and its crown is pierced by a large oculus, the deep rim of which provides a frame for the painting on the intermediate shell as seen from the pavement, giving to it a distance and magic perspective that is quite in accord with the idea of the apotheosis motive conveyed by the compositions actually painted on the domical surface.

The intermediate shell springs from a level about one-third up the haunch of the inner shell, which has nearly attained the vertical at this line and which, furthermore, gains great strength for support by the presence of the comparatively large oculus opening at its crown. Added support for this shell is given by a solid mass of masonry built across from the base of the attic wall to the inner shell. In section the middle shell is

ovoid or elliptical, indicating once more a possible suggestion from St. Paul's, which has a perfect cone for the work of supporting the lantern; but while St. Paul's cone is of brick, with cincture courses of stone, the Panthéon ovoid is of stone. Its haunches are cut by four large, round headed openings or lunettes, which have a span equivalent to three bays of the attic of the drum. These penetrations are contrived so that the entire weight of the intermediate shell is brought to bear upon lines of support that carry down directly to the four major piers below. Through the lunettes light from the windows in the attic wall above the exterior peristyle is permitted to reach the mural paintings by Gros upon the shell's solid crown. The latter directly supports the stone lantern. The stability of this shell is somewhat aided also by two stairways built upon its extrados, connect-

ing below with a spiral staircase contrived between the drum walls behind the blank wall areas above the piers and between the intermediate and outer shells to the springing of the latter, and connecting above with a winding stair on the interior of the lantern.

The outermost shell is again hemispherical in section, although the exterior disposition of this dome and its accessories gives the impression of a pointed section and is roofed with lead, laid so as to suggest ribs that carry through the lines of solid wall masses in the attic of the drum upon which it really rests. Its thickness is 19 inches at the base, and even this dimension is not main-

tained, for in the inner face of this shell are constructed four rows or tiers of arched recesses, sixty-four in number, disposed as shallow flat back niches—a type of construction described in French as *vergelé*; these recesses diminish in size as they rise toward the crown, and the spaces they enclose are considerably less than 19 inches thick, perhaps no more than eleven or twelve at most. At the upper level of the

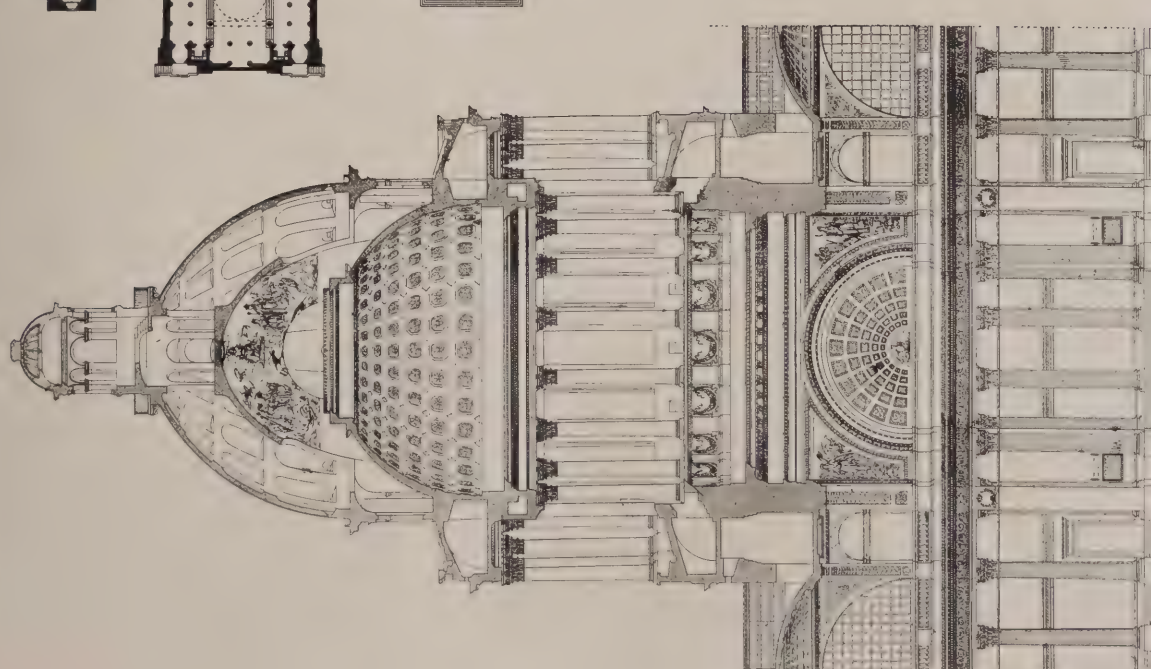
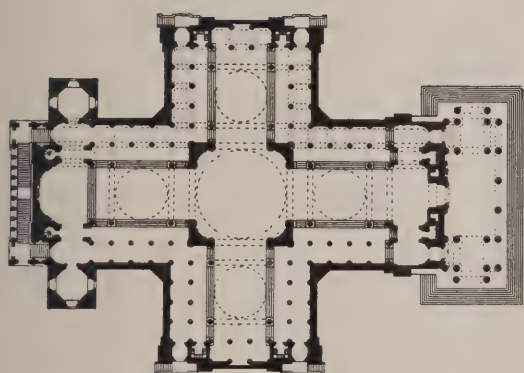


Section Showing Giant Arches Supporting Drums. (From Rondelet)

attic wall, just at the spring of the outer shell, a masonry floor is built over to the intermediate shell, helping to reduce what little thrust the outer dome may exert. The floor is cut by the four lunettes of the ovoid shell, but so reduces the light available from the windows of the attic that a row of small square openings had to be cut into the outer dome near its base.

The lantern maintains two distinct types of ordinance within and without, as does the drum. Appearing as a simple arcade between the outer and the intermediate shells, upon the latter of which it rests, it rises in slender elegance above the outer dome from which it receives a slight additional support and by which it is buttressed, its base surrounded by a projecting gallery, supported upon heavy brackets between which small square windows are pierced to aid in lighting the

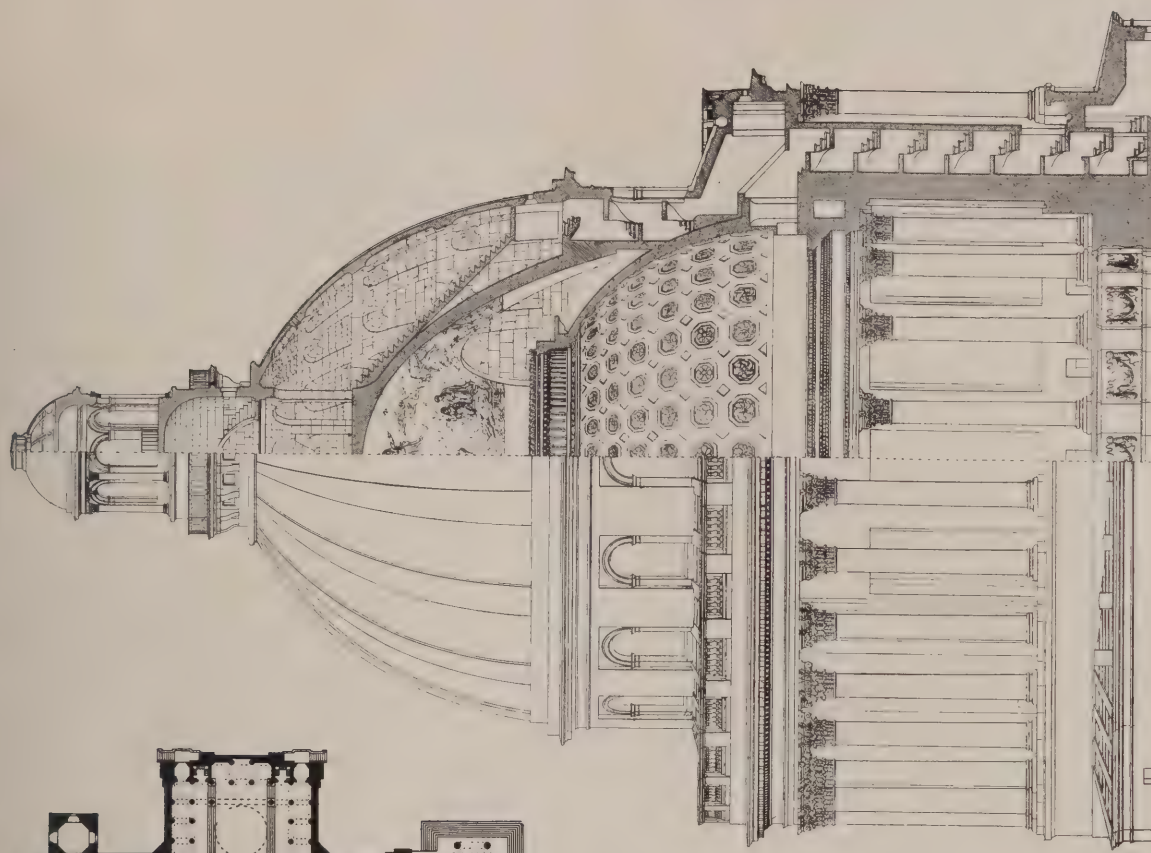




CROSS SECTION THROUGH DOME AND SUB-STRUCTURE  
(From Isabelle)

PLAN  
(From Simpson)

PANTHÉON, PARIS. STRUCTURAL DETAILS



HALF-ELEVATION AND HALF-SECTION THROUGH DOME  
(From Isabelle)

space between the intermediate and outer shells.

In architectural treatment above this point the lantern shows eight round headed openings alternating with engaged shafts, surmounted by a plain dome treatment with cross finial. In the interior the simple arcade above the intermediate shell bears a segmental vault with an oculus in its crown, the latter rising to a line just below the level of the window sills and within the balcony, which is not to be taken as indicating an interior floor level. Above the windows is a coved ceiling or flattened dome, with a large opening in its crown through which is seen the final covering for the lantern, a small dome of wood and lead.

The present gilded cross finial superseded three other motives designed for this position. Soufflot's original terminal feature was removed to give place to a figure of Renown by Dejoux. Later a figure of Immortality was designed by Cortot for this position, but when the building reverted to Catholic uses the erection of the cross finial put an end to these changes.

While the total height of the dome is 265 feet, the inner shell reaches a height of only 188 feet and a diameter of but 68 feet, its oculus measuring 31 feet across.

#### IV

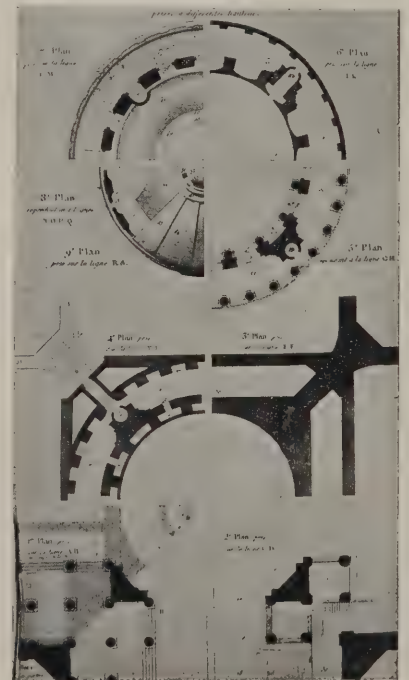
Fully acquainted with the particulars of Soufflot's design, and convinced that the piers were

sure to be too weak for the work expected of them, the architect Patte systematically proceeded to ridicule the dome design before its completion, and to point out the difficulties of its construction. He issued and broadly disseminated a "Mémoire sur la construction de la coupole projetée pour couronner la nouvelle église de Sainte Geneviève à Paris," in which he aimed to demonstrate that the piers then executed were inadequate for support of the dome. He adduced a number of famous examples to carry his point, but all of the examples cited are of buildings that have required repeated strengthening. This memoir was published in 1790; Soufflot died in 1780, hounded to death by the adherents of Patte, according to those who believed in him. At that time the drum had just been begun.

Rondelet had been associated with Soufflot, at the latter's request, since 1770, and superintended the construction practically alone from the great interior entablature to the end. No doubt his fine calculations are largely responsible for the success of Soufflot's numerous and intricately related structural expedients. The dome was carried to completion, and, as though to justify Patte's criticisms, a number of dangerous fissures appeared in the supports; in fact, Soufflot himself had noticed and tried to remedy some of these. In 1796 a commission of architects examined the work; in 1797 a commission of engineers covered the same ground, and in 1798 a joint commission



Comparative Plans of Drums and Understructures of the Domes of St. Paul's, London; St. Peter's, Rome; the Panthéon and the Invalides, Paris. (From Rondelet)



Plans of Dome and Understructures of the Panthéon at Eight Levels. (From Rondelet)



from both professions repeated the performance.

The engineers submitted findings to prove that the only safe solution of the difficulty was to provide adequate counter thrust for the dome. For this purpose they recommended the introduction of powerful buttressing arches in the height of the pendentives, supposedly to receive the dome thrust and lead it to the angles of intersection of the outer walls. The architects, realizing that the effect of domes on pendentives is in general centripetal, and that thrust in such domes may be considered as largely converted into load or at least bent to form a line of force or pressure more nearly approximating a vertical, and, furthermore, realizing that the peculiar structural system of this dome was particularly subject to this consideration, recommended nothing more than the strengthening of the piers. However, the actual upshot of all these investigations was that the arches were shored up to prevent the actual disintegration of the edifice, and after some other minor attentions the whole project was abandoned.

The only understanding and clear headed opinions at this time seemed to be those advanced by Jean Baptiste Rondelet, to whom the final execution of the dome is due. Rondelet published in 1797 a "*Mémoire historique sur le dôme du Panthéon français*," in which he examines in detail the logic of its construction, and then analyzes carefully the exact strength and reliability of all of its parts, the walls and immediate dome supports and their relation to the work they have to do, and finally the various defects which have occurred in the structure, notably in the piers, their causes and the means for remedying them permanently. Rondelet's studies really rehabilitated the good name of Soufflot as a builder, for it was demonstrated that the chief difficulty arose from the use of poor masonry and of brittle stone for the piers, due to the short sighted economies of an unappreciative clergy during the last decades of the preceding century. In this connection one is reminded of Wren's use of inferior stone in St. Paul's, because of difficulties in obtaining the desirable Portland stone, and because he considered it wise to commit the professional transgression of trying to complete his masterwork within his own lifetime. But in the French example the transgression was not the architect's.

Rondelet's publication was accompanied by excellent plates—none better have been issued to date—showing all parts of the edifice, with numerous illuminating sections, plans, and constructional diagrams. Under his direction the piers were strengthened, chiefly by approximately

doubling their girth, doing away with the corner columns of the original design, and adding pilasters in their stead. The resulting added strength sufficed to set all questions of stability finally at rest, and the primary recommendations of the investigating commission of architects in 1796 that the solution lay in the strengthening of the piers were thus substantiated.

In 1814 Rondelet published a new edition of his original study, with an additional discussion of the means employed in restoring the piers. This was accompanied by a number of new plates, giving all possible plans, sections, and views of the building; drawings showing the processes of shoring the arches while the work was in progress; plans showing the exact amount of material added to the piers and the resultant effect upon the design; and finally, even a plan showing the exact locations under the building of a surprising number of clay pits which had been filled to give proper foundation for the edifice. These pits caused numerous difficulties of settlement, because they had been filled with solid masonry, and may have had much to do with the weakening of the piers, due to uneven compression of earth beneath them.

## V

Taken as a whole, the Panthéon is a bold and a clever piece of construction, as even a cursory study of its plan and section will indicate at once. The amount of masonry needed was evidently reduced to a minimum, in fact, even seems to have exceeded that dangerous structural extreme, although we are willing to believe that, given good stone well handled and with proper foundations, Soufflot's piers would probably have been adequate.

As to the appearance of the dome as a whole, it should first be said that the exterior immediately suggests St. Paul's in London, but with the difference that the tall continuous peristyle offers no suggestion of buttressing for the dome. Structurally there is provision for such buttressing for the inner shell in the intercolumniations just above the four piers, masonry masses containing spiral stairways set back behind the frontal plane of the columns and disposed as are the corresponding masses in St. Paul's; but the expedient looks inadequate, although experience proves the contrary. The intermediate shell profits by the same arrangements, and, being ovoid in section, requires much less counterthrust and so does not very appreciably increase the work of the existing counteracting members. The weight of the intermediate shell is likewise greatly reduced by the four large openings cut into its base.

Some of the other buttressing expedients employed might also be noted here. In the first place, the engaged inner order of the drum is relied upon as a meager part of a buttressing system for the dome, and also gives direct support for the two inner shells. Again the masonry just beneath the large inner entablature upon which the drum apparently rests is corbeled out strongly, to aid in counteracting thrust from the dome. It was at this level that serious defects appeared in St. Peter's. To assist in counteracting the outer shell's thrust, and partly also to operate against that of the ovoid shell, the wall of the attic of the drum is made of almost triple thickness in all spaces between windows. Two other vaulted members are introduced to serve as buttresses between the two walls of the drum, one below the outer base of the peristyle and one just above its entablature; both are contrived as a series of penetrations in a half barrel vault.

\* \* \* \* \*

Our study has demonstrated that the architect was able to devise multifarious expedients to make permanent a structure similar to those which in all other great historical examples required chains and cinctures of wood to bind them, despite the use of comparatively heavier supports. The ingenuity of the designer has not militated against the success of his design; though the stability of his structure was endangered, the fortunate presence of his collaborator, Rondelet, saved the work and it still stands as the most impressive domical monument in France. Upon Soufflot's tomb we read that he had no other master than nature; if he learned his ingenuity from nature alone, his

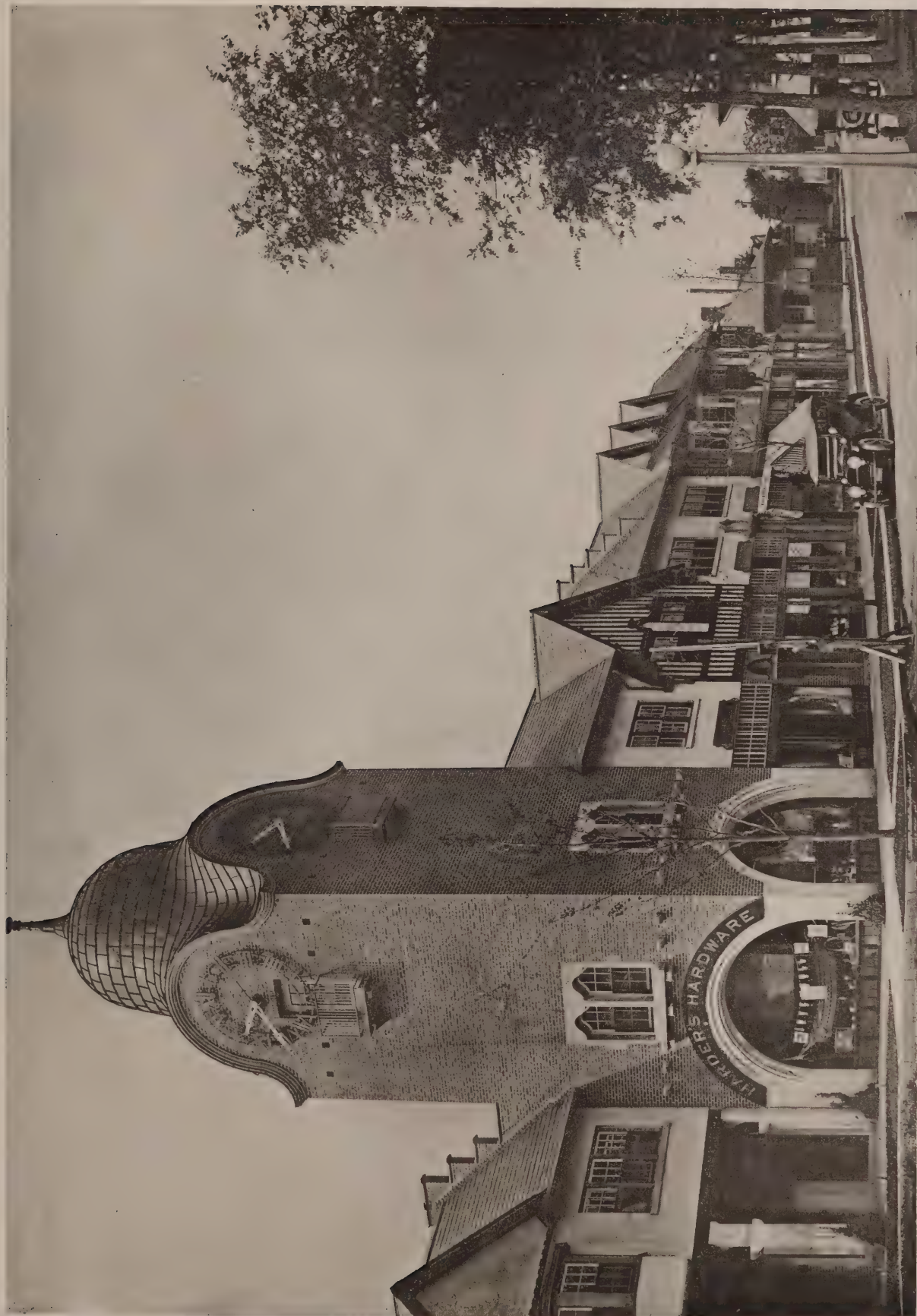
wisdom carried him dangerously near the brink of catastrophe, and yet withal most of us that study the Panthéon can learn much from his cleverness.

*Bibliographic Note.* For the benefit of those whose interest may prompt them to a further examination of the interesting problem of construction presented by the dome of the Panthéon, the following list of references is appended: Dilke: *French Architects and Sculptors of the 18th Century*, London, 1900; Dugdale: *History of St. Paul's Cathedral*, London, 1716; Gosset: *Coupoles d'Orient et d'Occident, Etude Historique, Théorique et Pratique*, etc., Paris, 1889; Isabelle: *Les Édifices Circulaires et les Dômes Classés par Ordre Chronologique et Considérés sous le Rapport de leur Disposition, de leur Construction et de leur Décoration*, etc., Paris, 1855; Legrand et Landon: *Description de Paris et de ses Édifices, avec un Précis Historique et des Observations sur le caractère de leur Architecture et sur les Principaux Objets d'Art et de Curiosité qu'ils Renferment*, Paris, 1806; Patte: *Mémoire sur la Construction de la Coupole Projetée pour Couronner l'Eglise de Sainte Geneviève*, Paris, 1770; Rondelet: *Mémoire Historique sur le Dôme du Panthéon Française*, Paris, 1797; Rondelet: *Mémoire Historique sur le Dôme du Panthéon Française ou Nouvelle Eglise de Sainte Geneviève . . . avec une addition sur la Construction de cette Eglise dans laquelle on indique le Procédés employés pour la Restauration des Piliers du Dôme*, etc., Paris, 1814; Simpson: *A History of Architectural Development*, New York, 1913, vol. 3; Ward: *The Architecture of the Renaissance in France*, etc., London and New York, 1911.



Panthéon, Paris. View of Transept and Dome





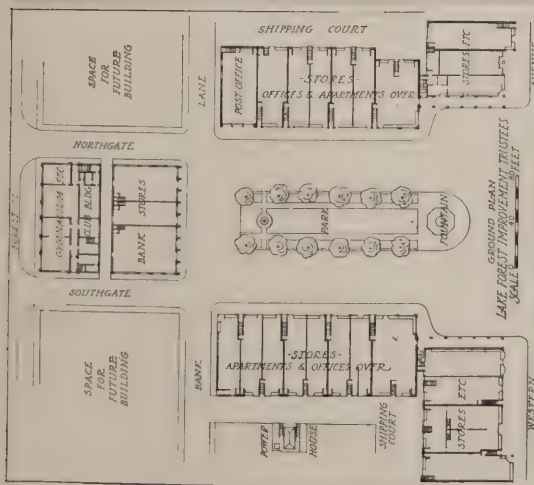
CLOCK TOWER AND SHOPS

MARKET SQUARE GROUP, LAKE FOREST, ILL.

HOWARD SHAW, ARCHITECT







GROUND PLAN



VIEW SHOWING FOUNTAIN AND SHOPS  
MARKET SQUARE GROUP, LAKE FOREST, ILL.  
HOWARD SHAW, ARCHITECT



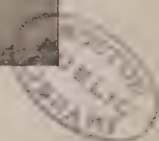




VIEW ALONG WESTERN AVENUE SHOWING OPENING TO MARKET SQUARE



BANK AND PUBLIC UTILITY BUILDING  
MARKET SQUARE GROUP, LAKE FOREST, ILL.  
HOWARD SHAW, ARCHITECT









SHOPS ON SOUTH SIDE

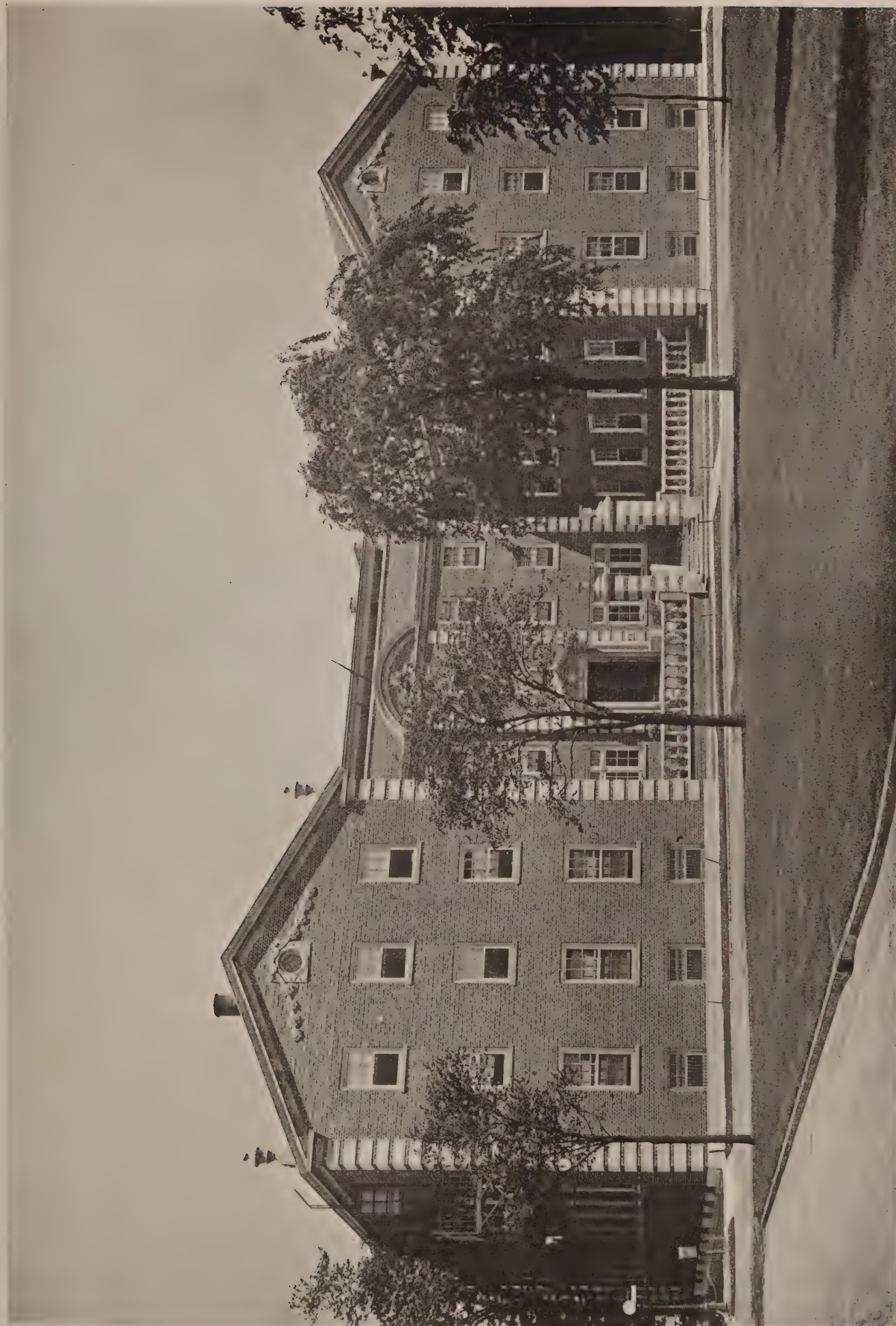


SHOPS ON NORTH SIDE  
MARKET SQUARE GROUP, LAKE FOREST, ILL.

HOWARD SHAW, ARCHITECT







GENERAL VIEW OF EXTERIOR

ELEANOR CLUB, CHICAGO, ILL.

RICHARD E. SCHMIDT, GARDEN & MARTIN, ARCHITECTS





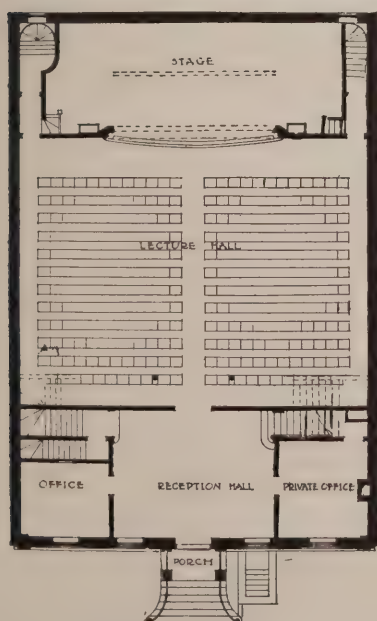


ELEANOR CLUB, CHICAGO, ILL.  
 RICHARD E. SCHMIDT, GARDEN & MARTIN, ARCHITECTS

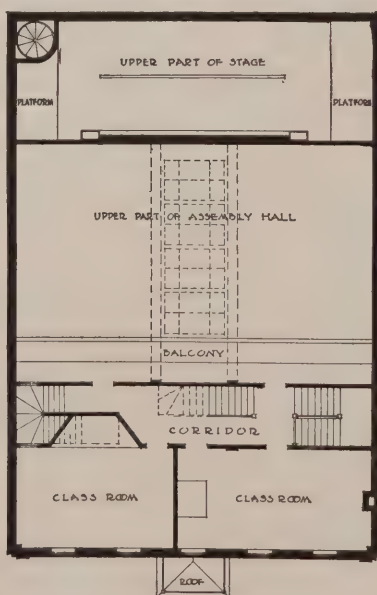




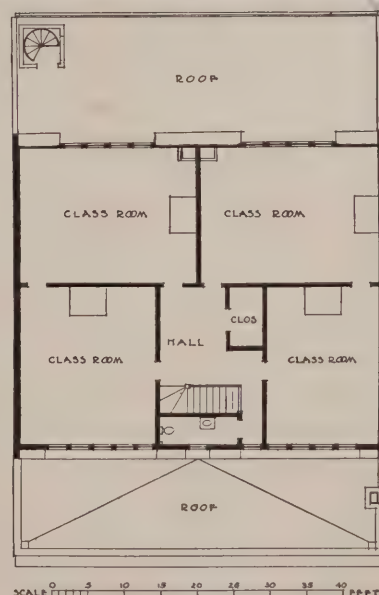




FIRST FLOOR PLAN



SECOND FLOOR PLAN



THIRD FLOOR PLAN

LELAND T. POWERS SCHOOL, FENWAY, BOSTON, MASS.

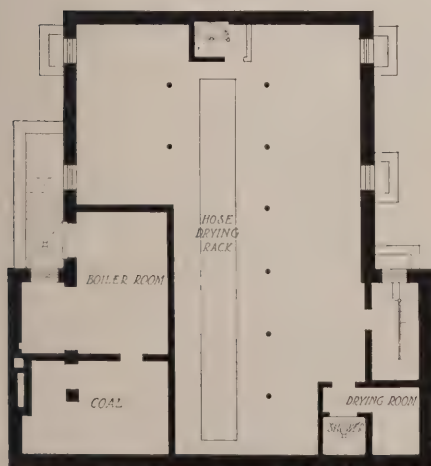
ALLEN W. JACKSON, ARCHITECT



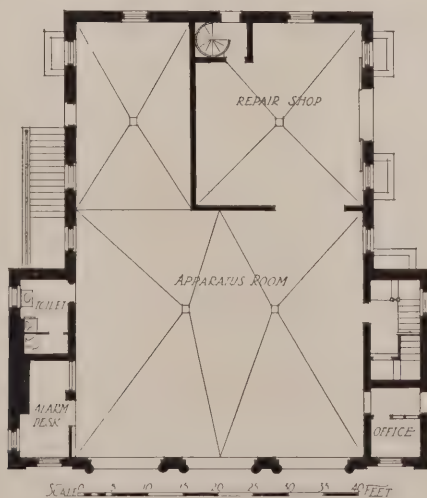




GENERAL VIEW OF EXTERIOR



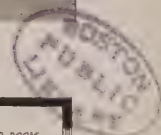
BASEMENT FLOOR PLAN



FIRST FLOOR PLAN  
FIRE STATION, SALEM, MASS.  
KILHAM & HOPKINS, ARCHITECTS



SECOND FLOOR PLAN









FRONT ELEVATION



GENERAL VIEW FROM SIDE



FIRST FLOOR PLAN

SECOND FLOOR PLAN

THIRD FLOOR PLAN

- A APPARATUS ROOM
- B ASSEMBLY HALL
- C CHIEF'S OFFICE
- D SAFETY VAULT
- E FIREMEN'S PARLOR
- F LIVING ROOM ETC.
- G BED ROOMS

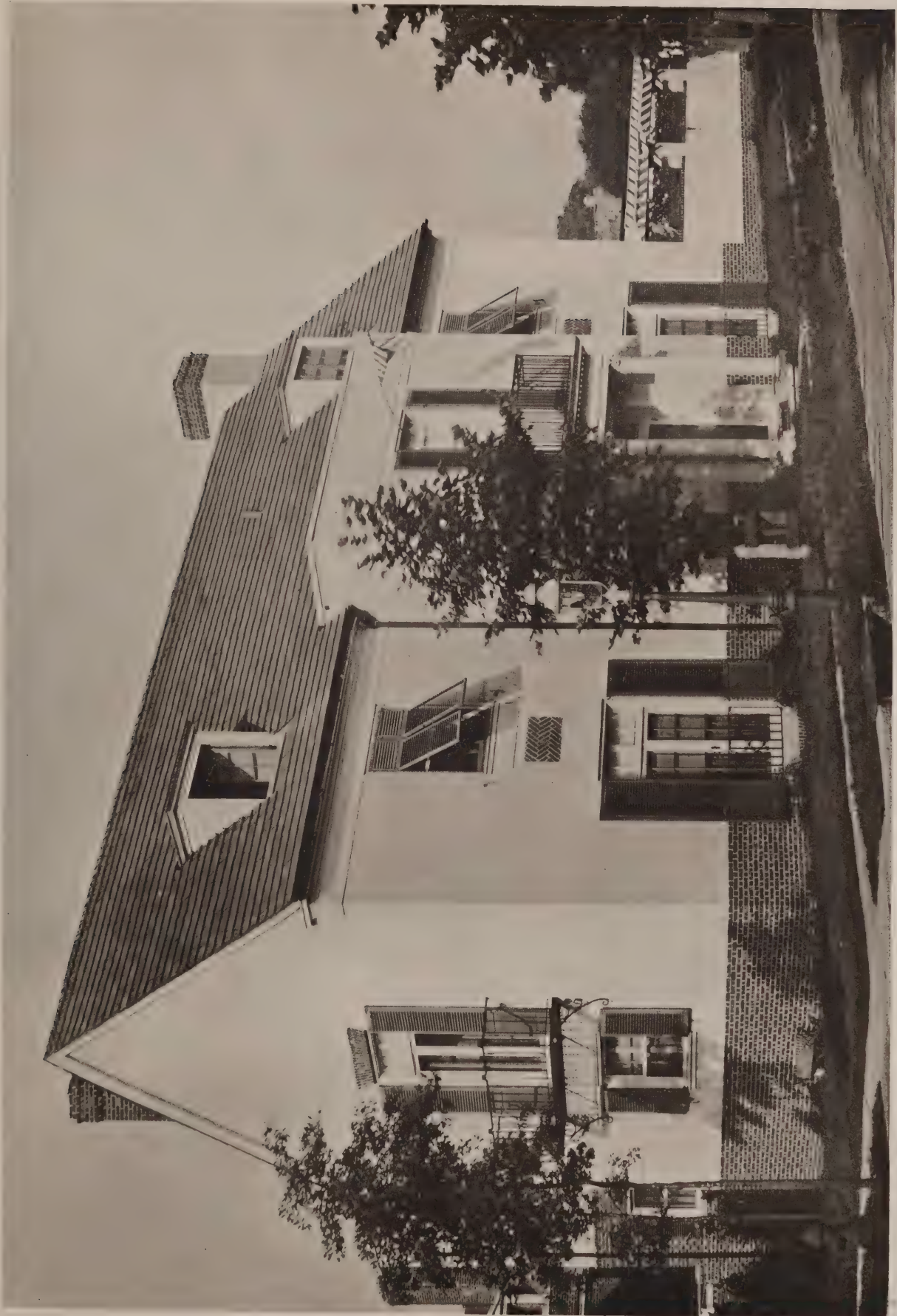
- J KITCHEN (TWO)
- K BATH ROOM
- L TOILET
- M COOK'S ALMOYER HALL
- N CLOSET OR STORES
- O TOWER (37.5. 20.5)
- P HALL (37.5. 20.5)

FIRE STATION, BRIARCLIFF MANOR, N. Y.

BATES & HOW, ARCHITECTS







GENERAL VIEW OF FRONT

HOUSE AT LINDEN COURT, ST. MARTINS, PA.

EDMUND B. GILCHRIST, ARCHITECT







VIEW OF END TOWARD STREET



VIEW OF GARDEN SIDE

HOUSE AT LINDEN COURT, ST. MARTINS, PA.

EDMUND B. GILCHRIST, ARCHITECT



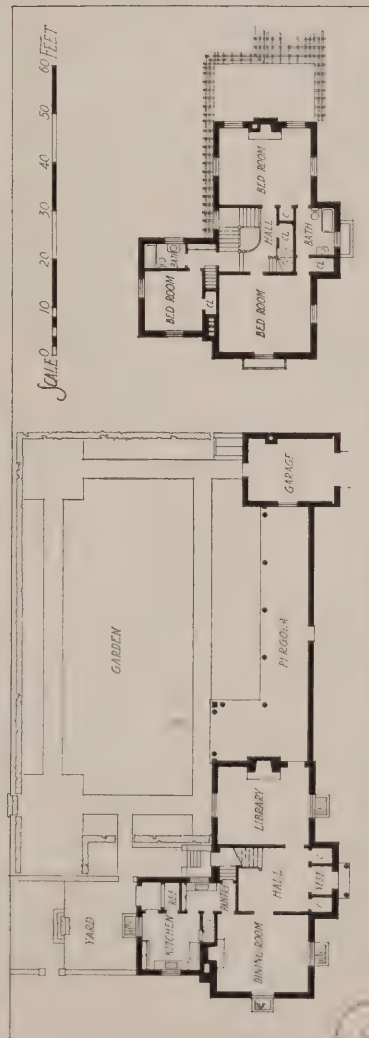




DETAIL OF ENTRANCE



VIEW IN PERGOLA LOOKING TOWARD GARAGE



FIRST AND SECOND FLOOR PLANS  
HOUSE AT LINDEN COURT, ST. MARTINS, PA.  
EDMUND B. GILCHRIST, ARCHITECT







VIEW OF GARDEN

HOUSE OF FERDINAND HOWALD, ESQ., COLUMBUS, OHIO

HOWELL & THOMAS, ARCHITECTS



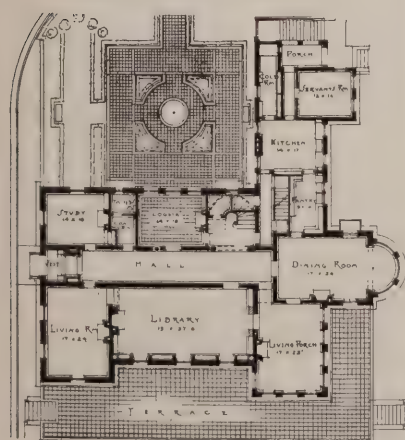




VIEW OF GARDEN FROM PERGOLA



SECOND FLOOR PLAN



FIRST FLOOR PLAN



DETAIL OF ENTRANCE

HOUSE OF FERDINAND HOWALD, ESQ., COLUMBUS, OHIO

HOWELL & THOMAS, ARCHITECTS







VIEW OF STAIR HALL



VIEW OF DINING ROOM

HOUSE OF FERDINAND HOWALD, ESQ., COLUMBUS, OHIO

HOWELL & THOMAS, ARCHITECTS







VIEW OF TERRACE SIDE



VIEW LOOKING FROM FORMAL GARDEN TO LOGGIA  
HOUSE OF FERDINAND HOWALD, ESQ., COLUMBUS, OHIO  
HOWELL & THOMAS, ARCHITECTS

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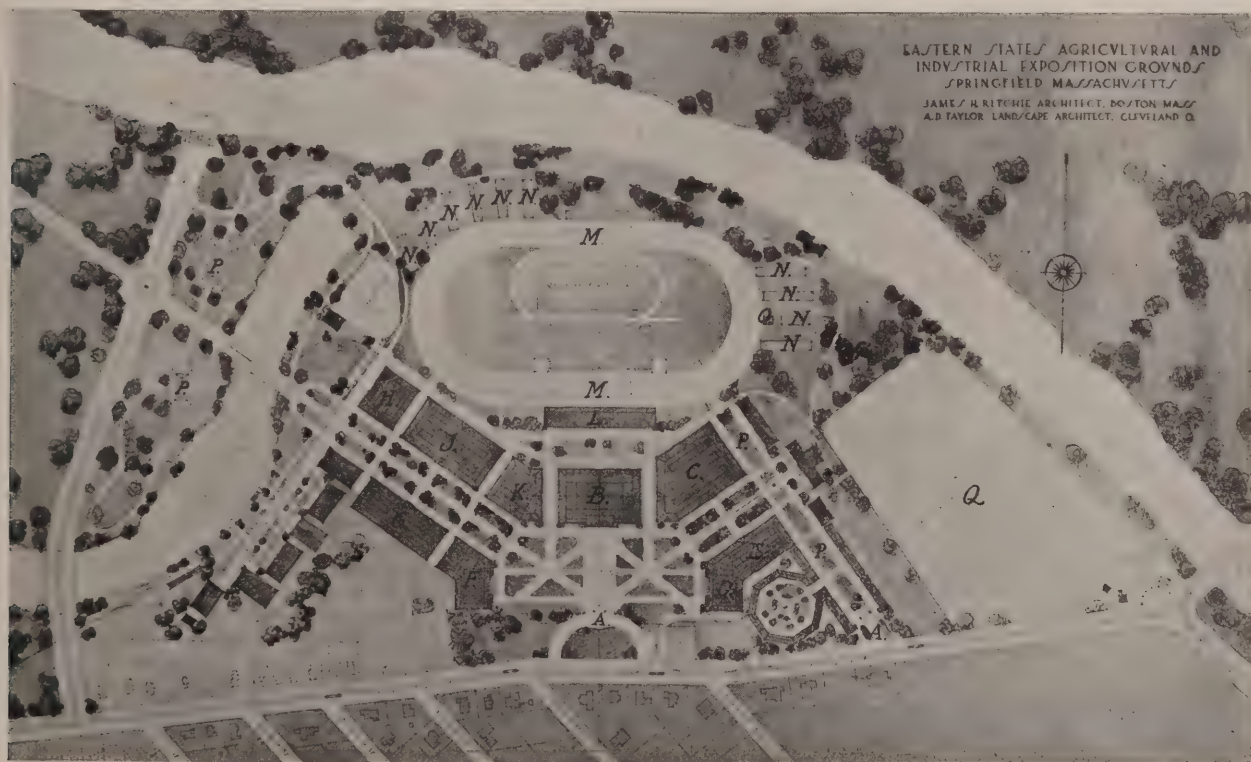


## Eastern States Agricultural and Industrial Exhibition Group, Springfield, Mass.

JAMES H. RITCHIE, ARCHITECT

THIS large group of buildings at Springfield, Mass., houses an educational institution of unique character. It has for its purpose the development of agriculture in the Eastern States and a closer coordination between this and other industries of New England. Its ambition is to make this region self-sustaining in food production and to promote among the people a demand for home-grown products with the ultimate aim of

solving the problem of reducing the cost to the consumer. The project was started two years ago with funds raised through subscriptions of influential men interested in the movement, and a popular campaign carried on in the region of Springfield in which \$580,000 was realized in ten days. The New England States have also taken an interest in the project and they are each committed to the program of erecting a permanent



General Plan of Exposition Grounds and Buildings

A Main Entrance  
B Coliseum  
C Exhibit Building  
D Women's Building

E Boys' and Girls' Exhibits  
F Poultry Building  
G Agriculture  
H Pigs and Swine

J Cattle Building  
K Horse Show  
L Grandstand and Restaurant  
M Half-mile Track

N Racing Stables  
O Blacksmith Shop  
P Amusement Building  
Q Auto Parking

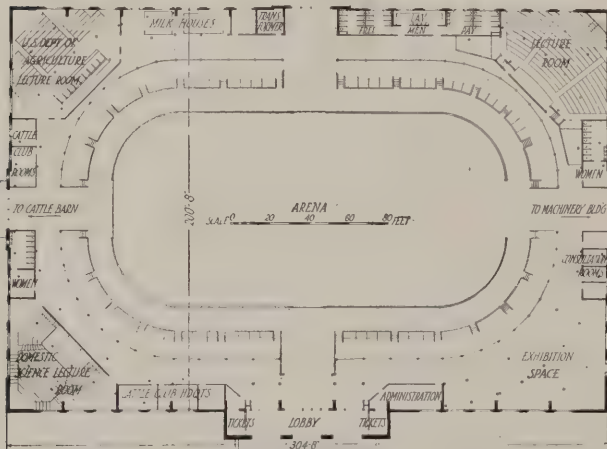
state building which will provide a rendezvous for the people of the state and also display its agricultural resources. Massachusetts has already appropriated \$50,000 for its building, and construction is to start at an early date.

The property lies in West Springfield, just across the river from the Municipal Center of Springfield, and is reached by trolley and good automobile roads. It is a tract of about one hundred and sixty-two acres bordering on the banks of the Westfield River. There is a continuous dike along the banks of the river to prevent flooding of the grounds at periods of the year when there is extreme high water. The lagoon which is being developed and improved is part of the old bed of the Westfield River and is a natural waterway. The avenue leading southwest from the Court of Honor and crossing the lagoon is on the axis of the Municipal Tower of the city of Springfield on the other

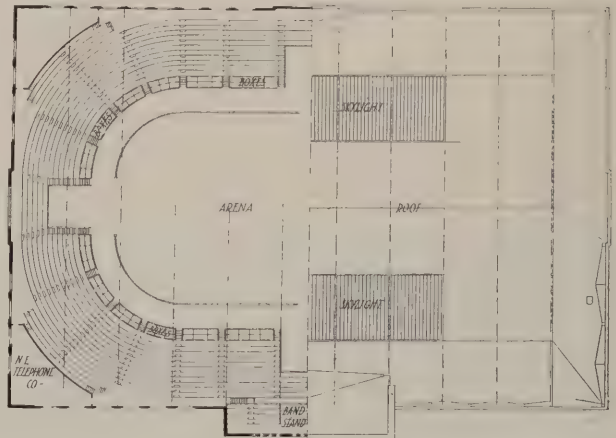
side of the river. This avenue also gives direct connection with a very large and imposing bridge now about to be erected connecting Springfield with West Springfield.

The general plan of the exposition as shown in the illustration herewith was determined largely by the location of the race track, which was installed before the work of developing the complete plan was undertaken. This track is reported to be the fastest one-half-mile dirt track in the United States.

The plan has recently been revised somewhat from the arrangement shown here, and the avenue of states indicated as facing the lagoon has been transferred to the avenue adjacent to the parking space which is marked in this plan "amusement section." This was found advisable owing to the necessity for increased buildings for exhibition purposes and because it was not thought best to



Ground Floor Plan



Half Roof and Seating Plan



General View of Coliseum from Main Entrance



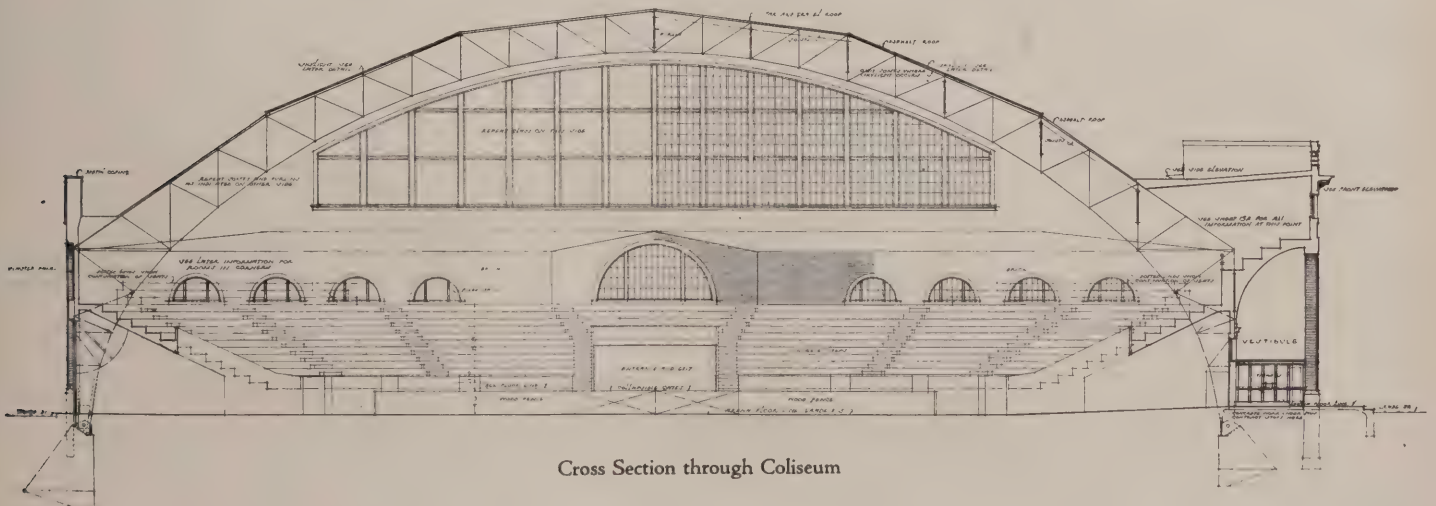


Interior of Coliseum

put the state buildings in such close proximity to the freight storage yard. The automobile parking space has been contracted somewhat in the later plan as it was found to be needlessly large, but even with its reduced area there is accommodation for 5,000 automobiles. The racing stables shown on the plan were erected last year and accommodate about 200 horses in box stalls.

The coliseum located on the main axis opposite the entrance to the grounds is 300 feet long and

200 feet deep. The construction of this building is of unusual character; its roof is supported by 10 steel trusses, weighing about 30 tons each, 72 feet high, and spanning the entire 200 feet — one of the largest spans in the country. The end trusses carry the curtain wall with the large glass opening and also the framing of the flat roof at each end of the building. The trusses were erected in approximately ten working days and established a record for speed in this section of the



Cross Section through Coliseum





DETAIL OF ENTRANCE TO COLISEUM

EASTERN STATES AGRICULTURAL AND INDUSTRIAL EXPOSITION GROUP, SPRINGFIELD, MASS.

JAMES H. RITCHIE, ARCHITECT





General View of Exhibit Building

country. The foundations are designed to resist the thrust, and the walls of the building are supported on reinforced concrete beams, 8 to 9 feet deep, spanning the distance between the truss footings, with pockets on the inner side to take the trusses. The weight of the beams and walls increases the load on the footings and guards against their sliding—a condition which otherwise would be possible because of the character of the

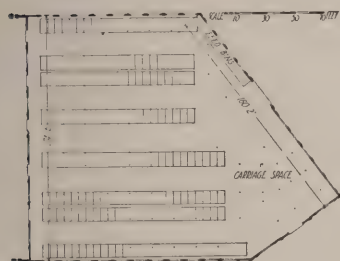
ground. The trusses are erected without tie-rods at the base, inasmuch as it was not possible to place them more than 2 feet below the floor level,

which would render the floor unfit for exhibition tanks or brine pipes for creating an artificial ice rink which may be incorporated as a later feature. The roof structure is of wood rafters carried by the trusses. The steep slopes were laid in asphalt and the flatter slopes in five-ply tar and gravel.

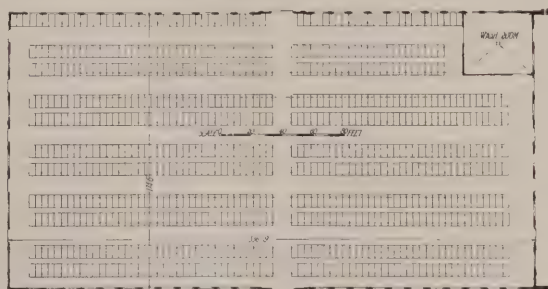
The skylights are of the



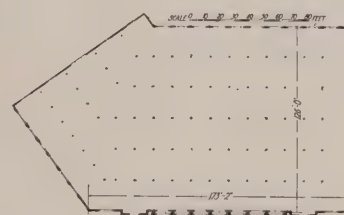
Plan, Exhibit Building



Plan, Horse Show Building



Plan, Cattle Building



Plan, Women's Building



General View of Women's Building

self-supporting anchor bar type. The exterior walls are of selected local red brick trimmed with terra cotta and tile. In the spandrels between the arches east and west of the central motif, executed in colored faience, are the seals of the six New England States, each nearly 4 feet high. The frieze of the central motif is polychrome terra cotta and tile executed in blues, gold, and crimson. The building is practically fireproof and cost in the vicinity of \$250,000.

Including the lecture rooms in three of the corners, the building will accommodate at one time, in round figures, 10,000 people. The seating capacity of the main amphitheater, including boxes, is about 6,700, and the main promenade around the ring will easily accommodate 1,500 people standing and still allow ample room for circulation. The ring is 96 by 200 feet, a trifle larger than that in Madison Square Garden, New York. The large doorways on the east and west walls of the building are arranged with portable mullions so that they may be taken out and the upper part of the doorway swung up, leaving a clear passageway 19 feet wide and 22 feet high, with openings of corresponding size in the exhibit and horse show buildings. The columns in each of these buildings have been so spaced that with these large openings there is a "straightaway" of over 800 feet with a start in the horse show building, continuing through the coliseum and finishing in the exhibit building. This feature which enables horses to pass through the ring at top speed is not found in any other group of buildings in the United States.

The exhibit building has an area of 66,600 square feet, which was found, however, to be insufficient for the exhibition held in the grounds

last year, and plans are now under way for a 50 per cent increase in its area.

The cattle and horse show buildings are splendidly lighted by a monitor type of roof and skylights similar to those in the coliseum. The roofs are of mill construction with heavy hard pine framing combined with steel. During the exposition of last year both of these buildings were used for the housing of prize herds. The two combined accommodated, in stalls  $3\frac{1}{2}$  by 4 feet, over 1,000 head of cattle. That portion of the women's building facing on the Court of Honor and the first three bays on the avenue opposite the exhibit building was erected during 1916. Plans for the immediate future contemplate the completion of this building, the new part of which will be for the exhibition of handicraft of boys and girls.

Under construction at the present time is a sheep and swine building and a temporary poultry building. Future plans call for a permanent building, however, which will be located on the Court of Honor opposite the women's building.

Immediate plans further contemplate a concrete and steel grand-stand and restaurant building to cost \$100,000 and to seat 7,500 people.

The ground on which the buildings are located is below the surface drain line of the surrounding streets, and this fact determined a method of drainage which, in addition to being efficient and economical to operate, contributes largely to the picturesque appearance of the grounds. A series of open moats was installed with all the roads pitching toward them. At certain points they are covered over with concrete slabs forming aqueducts and during the exposition periods the moats are flooded with water and changed frequently.



View of Coliseum from Entrance at Night



# Possible Uses of the Flat Roof

By RAYMOND M. ROBINSON

**B**RIEFLY, the purpose of this article is to suggest that a greater attempt be made to render the flat roof useful.

Look down upon the congested business districts of any of our large cities from a high point of observation. Everywhere is evident the desire to work each foot of ground to its greatest capacity, to reach higher into the clouds when expansion in any other direction is no longer possible. Yet we see spread out before us, all over the city, acres of flat roofs—the roofs of office buildings, hotels, factories, warehouses, department stores—bare and unused. Is it because this space is unadaptable to the needs of tenants? It is far more likely that the owners of these buildings—and their architects—have overlooked the fact that these areas might well serve countless purposes.

To be sure, we occasionally find a flat roof endeavoring to make itself useful. The so-called roof garden, generally a beer parlor which derives its name from the artificial grapevine which decorates its colonnaded outskirts, has long furnished a certain type of hotel with an excuse for front page advertising. In the tenement districts roofs are made to serve as laundry yards, which purpose they generally serve but poorly owing to the fact that they are seldom high enough above their neighboring tenements to escape the smoke from innumerable flues. Here, too, on hot summer nights, they become breathing spaces for the tenants, although little effort is expended to make them suitable for this purpose, the owner considering that he has done his part when he has provided a stairway and a parapet to prevent children from falling off into the alley.

It is safe to assume that not more than 5 per cent of the available roof area of our cities is serving any purpose. Available space is, of course, understood to mean that part of the total roof area which remains after deducting the usual elevator and stair penthouses, flues, and skylights.

The problem becomes resolved then into two questions: Is it practical from a financial standpoint to attempt to make use of the roof to a larger extent than at present; and, secondly, if it is practical, to what uses can the roof be put?

The returns yielded by an office or loft building depend upon its percentage of rentable area. The primary consideration in the planning of buildings of these types is to obtain the greatest possible amount of rentable space out of a given

cubage. When the roof becomes rentable, the value of the building is increased, provided the cost of developing the roof is not excessive.

As for the question of expense, it is one which cannot be answered in general. It depends entirely upon the nature of the business for which the roof is to be rented and the requirements of the particular problem. It is probable, however, that the expense would usually be no greater than the cost of finishing off a like area on a typical office floor, and perhaps much less.

The first step, then, is to consider to what purposes roof room is particularly adapted—in short, what industries require light and air in abundance.

Perhaps the first suggestion is agriculture and its allied industry, horticulture—a somewhat startling suggestion, to be sure. Market gardening in the skyscraper belt is not the rule at present, and our conception of horticulture in the closely congested parts of the city is likely to include little more than an occasional window box and the aforesaid artificial grapevines. But is it difficult to imagine greenhouses over our offices? After all, a greenhouse isn't much more than an overgrown penthouse with skylights, light in construction, so that the additional load on the roof girders is not prohibitive. In fact, this single item of extra roof framing is the only thing that raises the cost of the greenhouse on the roof over the cost of the same building erected in the country; while the fact that the isolated greenhouse has its own foundation for which excavation must be made scores a point in favor of the roof house. Moreover, the greenhouse in the country must have its own heating plant, its own lighting and plumbing facilities. On the roof it takes its heat and its light and its water from the systems which supply the entire building.

Greenhouses covering 5,000 or 6,000 square feet are quite within the range of possibility on many of our larger buildings; while department stores, which as a rule have larger unbroken roof spaces than office buildings owing to the fact that they are less likely to be of the U-type plan, might easily afford several times as much area.

The standard width for greenhouses is 40 feet, although smaller ones are frequently used and could be adapted for small buildings or U-type buildings with narrow wings. The 40-foot house could be placed without difficulty on broad, unbroken roof areas—warehouses and department

stores, for example. Office buildings of the U type whose typical floors form their wings of two 20-foot offices with a 5-foot corridor, would accordingly permit the erection of a standard size greenhouse on each wing with sufficient space on all sides for circulation between the house and the parapet.

It is probable that these greenhouses would be more in demand by florists, whose source of supply would thus be placed close to their city showrooms, than by the markets whose produce generally comes from wholesalers; but it is equally probable that many markets, particularly the higher priced shops of the so-called exclusive variety, could use them with profit for the raising of winter vegetables. Winter strawberries must be raised under glass, and they bring high prices eight or nine months of the year.

The greatest difficulty in the adaptation of roof greenhouses to market gardening lies in the necessity for frequent renewals of soil and in the depth of soil required for most vegetables and in the need for much natural fertilizer. The amount of fresh, moist dressing which would have to be carried to the roof on the freight elevators would not only necessitate large storage facilities on the roof, but it would be likely to fill that part of the building near the elevators with objectionable odors whenever the dressing was being carried to or from the roof. Then, too, the labor of supplying a sufficient quantity of dressing for a greenhouse large enough to be worth while would deter most gardeners from making the experiment. Nevertheless, there are fruits and vegetables, such as strawberries, which require comparatively little soil and dressing or which can be fed with artificial fertilizers; these could well be raised in roof greenhouses with little inconvenience and supplied to markets with the saving of freight charges and careful packing—an important consideration when they must be brought in from a distance.

On the whole it is probable that the roof greenhouse would appeal more generally to florists. Hothouse flowers as a rule require little natural dressing. Artificial fertilizers or dried dressings, such as sheep dressing, which may be obtained in a condensed form, dry and odorless, are commonly used. These could be taken to the roof without difficulty and easily stored in convenient quantities. The variety of plants adaptable to such greenhouses is also much larger than in market gardening. An expert with whom the writer discussed the question expressed his enthusiasm over the suggestion, remarking that roof greenhouses for the cultivation of carnations alone for city

stores would be worth while. The problem of transporting sensitive plants and cut flowers from suburban sources of supply to city salesrooms becomes serious in cold weather. Many a consignment of flowers has been ruined by frost during shipment because insufficiently protected. A greenhouse on the roof of a commercial building, supplying flowers to a florist's shop on the street floor of the same building, would eliminate entirely this important item, besides placing the entire supply within reach of the salesmen.

That the suggestion is practical, has already been proven in several instances. One of the New York department stores maintains an extensive range on its roof, where a considerable variety of plants are raised, and elsewhere florists are making similar experiments. So far, however, the practice has not become common, perhaps for the simple reason that most of us haven't thought of it, or perhaps because, the idea being new, the average city florist has preferred to wait for somebody else to try it first.

If it may be admitted that there exists an adverse side to the question, it is only fair to add that the adaptation of roof greenhouses to the cultivation of flowering plants in large quantities has not yet been without difficulties, at least on very high buildings. For some reason, many plants do not bloom well under these conditions, and patient study and experimenting will be necessary before the exact cause for this lack of complete success is found and corrected. With foliage plants, however, no such difficulty is encountered, and their cultivation at any altitude likely to be reached is thoroughly practical. Thus it may be found that the particular use of the roof greenhouse will depend somewhat upon the height of the building upon which it is placed.

Most large hotels require great quantities of flowers, cut and potted, ferns and palms, particularly the latter, for decorations. Frequently their decorators find it necessary to carry many team loads of supplies to the hotels for an evening's entertainment, remove them the following morning, and perhaps return with them a day or two later. This, in extreme winter weather, means much labor and careful protection against freezing. The advantage of a single glass roofed storage house on the roof of the hotel is obvious. It is quite probable that florists who hold contracts with the hotels for extensive decorating would find it economy to maintain such a greenhouse if granted the privilege, particularly if given the additional privilege of keeping a stand in the hotel lobby for the sale of cut flowers. In fact, several of the



large hotels have roof conservatories where much of their decorative material is raised and stored.

From greenhouse to open air gardens is but a short step, but the open garden presents difficulties that the greenhouse does not, and it is unlikely that it will appeal quite so readily to the prospective lessee. Yet it is by no means an impossibility, and with the problems of a sufficient supply of soil and of adequate drainage satisfactorily worked out it might be made practical. On buildings of great height climatic conditions would have to be considered, for conditions only 100 or 200 feet above ground are not the same as at earth level. Hail storms at an altitude of 300 or 400 feet might do far more damage than at street grade. Wind breaks would have to be provided. On the other hand, there would in all probability be much less harm done by insects and birds.

Of the two schemes the greenhouse is the more practical, but agricultural and floricultural experts admit that neither greenhouse nor open garden on the roof is to be dismissed as an absurdity.

Consider for a moment the studio. A generation or two ago when a photographer set up his shop he needed little more in the way of stage props than a claw footed armchair and a hazy back drop of woolly clouds and trees and a Renaissance gatepost. An artificial palm was the limit of his requirements. We all still cherish, somewhere in our possessions, the old family album, leather bound, with brass corners, wherein rests the photograph of Uncle John and Aunt Emma, taken on their honeymoon in the late seventies. John, stiff and solemn, sits erect in the claw footed chair, one hand clutching his hat while the other grips the arm of the chair. At his side stands his meek little bride, one hand resting on her master's shoulder. To-day we are more exclusive in our tastes. We do not care to be photographed against the same background that has served for a thousand other sitters—we want something different. For a time the stock casement window did very well until every movie actress from Mary Pickford down had been pictured with an I-see-him-coming expression on her million-dollar face. Then leaded glass went out of favor and the Queen Louise staircase came and went. Now, when it is possible, we summon the camera man to our homes; when it is not possible we put it up to him to provide a background that will not be recognized at first glance by our friends.

Here again the roof offers its advantages. A roof studio provides the widest range of possibilities in lighting; it also gives innumerable opportunities for out-of-door settings. The old-fash-

ioned garden, the Colonial doorway, the garden gate—the list may be prolonged *ad infinitum*. The lady who goes in for æsthetic dancing may pose *a la Psyche* without the bother and expense of taking the artist into the country in search of a real pool.

The painter likewise may find in the roof studio advantages that the ordinary indoor rooms cannot possess. The typical office in the modern office building does not afford very satisfactory lighting facilities as a rule, from the artist's standpoint—not the sort of lighting, at any rate, that one expects in carefully designed studios. Overhead lighting, so essential to exhibition rooms of any considerable size, is not generally to be found in office buildings. Perhaps this accounts in part for the fact that the art centers of our cities are frequently located among the old buildings of second class construction, whose upper stories are easily converted into studios by the addition of skylights, either of hipped or sawtooth form, which can be readily cut into old wooden roofs, but not so easily added to the newer buildings of steel and concrete construction. Experience is showing that studios erected upon the roofs of high buildings and taking the form of bungalows, cabins, deck houses—whatever you wish to call them—come about as close as possible to the ideal studio in the crowded sections of a city. For the art schools such quarters may be particularly well adapted. There are limits, of course, to the landscape possibilities; but the art school which can offer outdoor class rooms in the heart of the city has an attraction which few can offer at present.

Many city schools, located in districts so congested that proper playgrounds are impossible, have used their flat roofs with success. The chief consideration seems to be a high fence of stout wire netting above the parapet to protect the heads of passersby in the streets from flying missiles. Outdoor class rooms which not long ago were thought to be desirable only in children's hospitals and similar institutions, are now becoming more and more in demand. In the country or suburbs the problem is simple. In the center of the city, particularly in the over-inhabited slum districts, the only available location is the roof. In fact, so far as the city school is to be considered, there is little excuse for not utilizing every available square foot of flat roof, either for playgrounds, for open-air class rooms, or for the little flower and vegetable gardens that the primary school pupils are taught to cultivate.

Large department stores often maintain a chil-

dren's department where mothers may leave their youngsters in the care of nurses while they are busy with their shopping, but comparatively few stores have used their roofs for this purpose. Even vaudeville houses and moving picture theaters have provided rooms where children may be checked for the duration of the performance, quite as one might check an umbrella, but the rooms are generally artificially lighted and artificially ventilated, often in the basement, and far from desirable. Again the question. Why not go to the roof? It might necessitate elevator service, but many theaters are installing elevator service anyway. All this in recognition of the fact that the custom of children exists. There are those of us who are still old fashioned enough to object to checking the baby. We shudder to think what might happen if we lost the brass tag.

While we are still on the general subject of playrooms and playgrounds, let us consider for a moment the possibility of roof playgrounds for grown ups as well as for children. Given a roof of a fairly good sized office building, add a couple of locker rooms and toilets and a shelter, lay out as many tennis courts as the space allows, all of which adds but little expense, and you have a source of income which will last from early spring until the snow flies. There can be no doubt that a public tennis court, so located, would draw all the patronage it could accommodate when its existence once became known. That a mid-week double header in the American League can draw twenty or thirty thousand men from their desks is sufficient evidence that any attractive sporting proposition will bring out its followers any day in the week, whether school keeps or not. Outdoor skating rinks are also among the possibilities of the roof, although incurring greater initial expense.

Places of amusement of various sorts have long been erected on roofs, particularly on the roofs of hotels. It is hardly worth while to go into detail on this subject. Cafés and restaurants, cabarets, open air dance halls, and summer theaters have all been found successful. Here again adequate elevator service must be provided, for the greater part of the theater's patronage must be carried to and from the street in a short space of time, before and after performances, except of course in the case of continuous performance houses, where the audience is constantly changing. The New Theater, New York, which unfortunately failed to realize the dreams of its founders, and which later became the Century, made use of nearly the whole of its great roof by erecting here a smaller theater, directly over the main auditorium, where

plays for children were given, besides providing a tea room, with its service rooms, and a promenade or open foyer to be used in conjunction with the larger theater. A palm garden, glass covered, was made available for use throughout all seasons of the year, with restaurant service. Other theaters and opera houses have made use of the corresponding space for rehearsal rooms and dramatic schools.

Stores, manufacturing concerns, and large offices might well place their employees' rest rooms on the roof with double advantage. The location offers far greater attractiveness than inside rooms, while the space which would otherwise be used would thus be freed for commercial use.

Wireless stations are common on the roofs of stores and offices which find it worth while to maintain their own service, although at present private plants are either dismantled for the duration of the war or have been taken over for the exclusive use of the government. Incidentally, mention of the war brings out the fact that many a rifle club and home guard company, born of the preparedness movement, has found its most convenient parade ground on the roof.

Many a club of considerable size and pretension, with quarters on the upper floors of an office building, has apparently overlooked the chance the roof over its head offers for development.

Even living quarters are well worth considering. Placed high above the streets, they prove far more pleasant and quiet than the average tenement. A Chicago architect has recently built for his own use a \$40,000 bungalow on the roof of an eight-story apartment house. Without commenting upon the rarity of architects who can build themselves \$40,000 residences, it may be mentioned that the house has proven extremely pleasant. Sufficient space surrounds the building for generous promenades and verandas, a wide view across the city and lake is afforded, the air is cooler and clearer than at street level, and the absence of insects at the roof grade has made screens unnecessary. A similar residence on a twenty-one story building in New York is the home of a prominent actor who also is enthusiastic over his lofty roof dwelling. Altogether the experiment has been found so successful that it is quite probable that it will be widely copied, although one is inclined to imagine that the owner might find himself at a disadvantage if his hat should blow off.

When once architects commence to consider the flat roof as a great undeveloped possibility, the wonder will be not what can be done with it, but why it has been so neglected heretofore.



## Details of Italian Renaissance Architecture

MEASURED DRAWINGS BY MAURICE P. MEADE

**I**N the presentation of details from the work of Italian designers of the Renaissance, little has been shown of the examples existing in Siena. The accompanying plates of this series, however, are of details found in that city, scarcely half a hundred miles south of Florence—the birthplace of the Revival. Together with all the dignity and reserve of the Renaissance, a slight deviation of the style is to be noted in some of the structures of brick that is peculiar to the region.

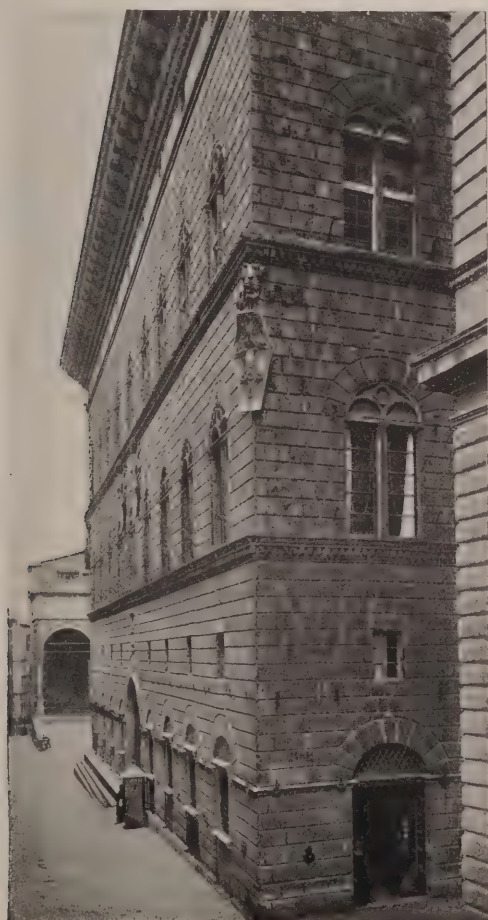
In the drawings of the first plate is shown the doorway of a house in Siena with a simple architrave, devoid of ornament, framing a finely proportioned door. The façade of this unpretentious house is of the characteristic brick and stone trim treatment. There is a pleasing simplicity to the stone mouldings in contrast to the woodwork of the doors with their deep panels and delicate bosses.

In the second plate is depicted the main entrance door of the Palazzo Piccolomini, now the Palazzo

Governo, erected about 1469 for Nannie Piccolomini, father of Pope Pius III. There is a slight resemblance to the Palazzo Riccardi in the general conception of the façade, but with a lighter and more uniform treatment of the rustication and the appearance of greater height.

On the front wall in bold relief are carved shields bearing the arms and crests of the Popes Pius II and Pius III—both members of the Piccolomini family. The grand doorway centrally placed on this façade is a fine example of an arched opening, the architrave consisting of a wide fascia and splay member surrounded by a bold outer moulding—the base mould of the building. Just above the voussoirs composing this larger arch is a delicately cut bas-relief of the family seal.

The third plate includes general details of interest on the building, such as the rustications, base moulding, stone seat, and the windows behind grilles in the plain ashler recessed arches.



View of Main Facade



Detail of Second Story Windows

Palazzo Piccolomini, Siena, Italy

FACE OF WALL

SCALE FOR DETAILS  
 $\frac{1}{2}$  FULL SIZE

CENTRE LINE OF DOORWAY

2'-6"

3'-9 $\frac{1}{2}$ "

2'-6"

15'-0"

2'-6"

7" REVEAL

HALF ELEVATION OF DOORWAY  
SCALE  $\frac{1}{2}$ " = 1'-0"

ITALIAN RENAISSANCE  
DOORWAY SIENA

MEASURED & DRAWN BY  
MAVRICE P MEADE

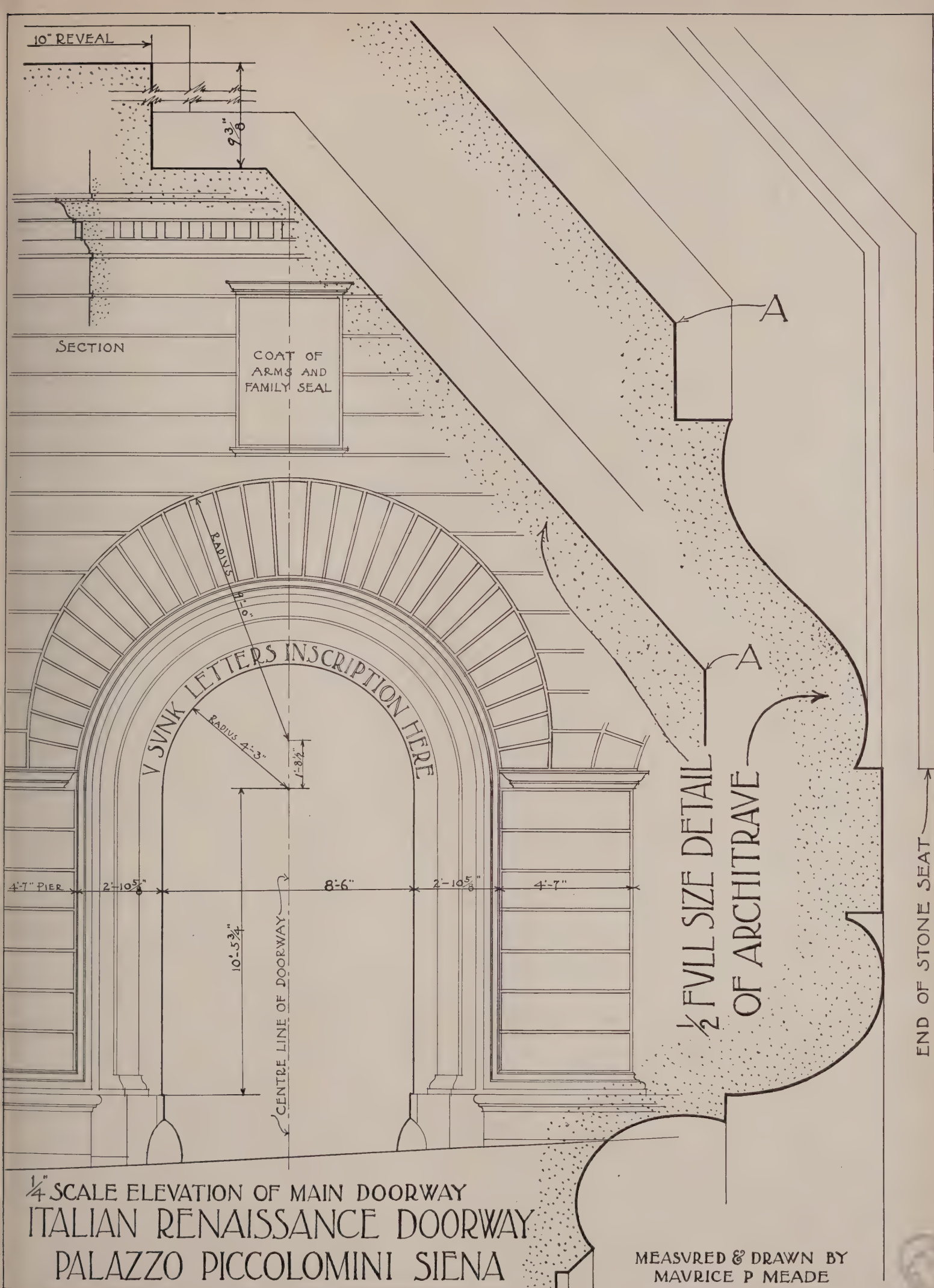
DETAIL OF WOOD DOOR

SECTION THRO' STONE ARCHITRAVE

4 $\frac{3}{4}$ "

7" REVEAL





FACE OF WALL SURFACE X  
DETAIL—C

DETAIL—B

DETAIL  
E

SPRING OF  
ARCH ON  
THIS LINE

SCALE FOR DETAILS  
 $\frac{1}{2}$  FULL SIZE

FACE OF WALL SURFACE X

DETAIL OF RUSTICATION

DETAIL—D

SECTION

PART ELEVATION

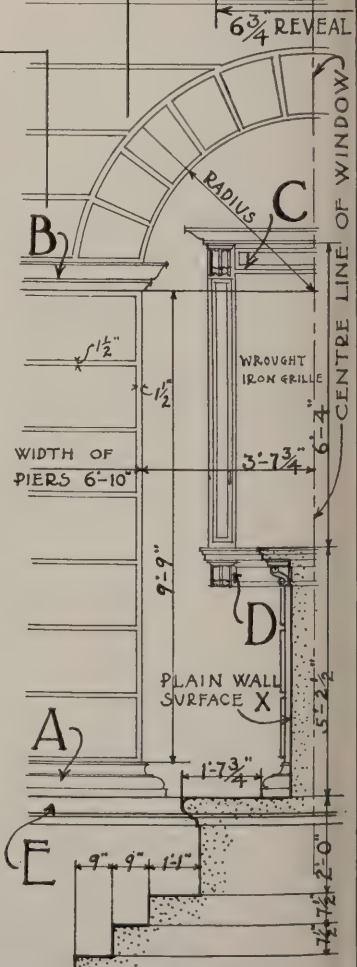
BRACKET  
5" WIDE

DETAIL—A

ITALIAN RENAISSANCE DETAILS  
PALAZZO PICCOLOMINI SIENA

MEASURED & DRAWN BY MAVRICE P MEADE

TOP OF SEAT



TYPICAL 1<sup>ST</sup> STORY WINDOW  
SCALE  $\frac{1}{4}$ " = 1'-0"



## PLATE DESCRIPTION

MARKET SQUARE GROUP, LAKE FOREST, ILL. PLATES 65-68. The ground occupied by this square was formerly filled with small frame shops, mostly one story high, facing the railroad station, and behind them were excessively deep back yards often filled with rubbish. In view of the conspicuous location a plan was evolved by a self appointed committee for purchasing the ground and rebuilding the area in a manner which would be a credit to the town and a profitable investment. In consequence the property was acquired and the buildings erected by the committee, acting as trustees. The money was obtained by voluntary subscriptions from the residents of the town, for which they received trustees' certificates. The land and buildings in their completed form have cost approximately \$550,000, including the parking, fountain, paving, sidewalks, lighting, etc. In place of 15 or 16 old tumbled down shops, the improvement has 28 stores, 24 apartments, 12 offices, a large Y. W. C. A. occupying the entire second story of the building at the end of the square, at the rear of which is a building 50 by 94 feet entirely devoted to a men's club and gymnasium. There are still two pieces of vacant property where eventually a public library and other similar buildings will be erected. The parking and streets have been dedicated to the city as a gift, which maintains lighting, cleaning, and the fountain. About 12 per cent of the space remains to be rented, and the investment when this is accomplished will pay between 4 and 4¼ per cent. In general the style is English, though the towers suggest Munich.

ELEANOR CLUB, CHICAGO, ILL. PLATES 69, 70. The dimensions of this building are 147 feet frontage and 88 feet depth. Exterior walls are brick, and interior bearing walls, hollow tile. Partitions and furring are of clay and gypsum tile. The main floors and roof are of reinforced concrete with metal lath and plaster suspended ceilings. The roofs of the wings are of frame construction covered with variegated slate. The roof garden floor is quarry tile, basement floor cement, and all others and stairs of terrazzo. The interior finish of first floor is quarter sawed white oak; that of sleeping portions straight sawed white oak. The toilet rooms are wainscoted with Missouri marble. Plumbing fixtures are enameled iron. The exterior walls are faced with wire cut brick and limestone. Heating is effected by a graduated control steam system with steel boilers. The building was constructed early in 1916 and cost per cubic foot 22.76 cents, including mechanical equipment.

FIRE STATION, SALEM, MASS. PLATE 72. This building is faced with water-struck brick laid in English bond, with wide rough joints, which gives the effect of antique brickwork. The exterior was designed to harmonize with the old Salem buildings, a good many of which, spared by the conflagration of 1914, are in the vicinity. The building has a slate roof and the shutters and blind work on the front elevation are painted a sage green, while the cornice, railings, etc., are white. The first floor is of reinforced concrete construction entirely waterproof. The walls of the apparatus room are of sand-lime brick with an English black enamel brick base. The second story contains nine individual bedrooms with shower baths, linen closets, etc. There is also a repair shop with provision for its future extension and the usual equipment of hose drying racks, dryers for firemen's clothes, etc. The building contains 143,235 cubic feet and cost \$28,230, or about 19 cents per cubic foot.

HOUSE AT LINDEN COURT, ST. MARTINS, PA. PLATES 74-76. This house is coated with rough-cast on 13-inch brick walls, the plaster being made of clean white sand with a little screened Jersey gravel added to kill the dead white and brought to an even floated, sand finished surface. The wrought iron balcony and French window grilles are executed in a smooth, workmanlike manner with a refreshing absence of conscious "hammer marks." The column capitals at the entrance portico, with their dolphin volutes, are lovely bits of detail and beautifully carved. The roof is covered with split cypress shingles with beveled butts. The plan and the interior finish are extremely simple. All the woodwork is white and very carefully studied with a view to making its appeal on premises of line and proportion. The house is heated by a warm air system and cost a year ago 23 cents per cubic foot.

HOUSE OF FERDINAND HOWALD, ESQ., COLUMBUS, O. PLATES 77-80. This house was built in 1912-1913 and cost 40 cents per cubic foot, the total cost being about \$75,000. The house and garage are of fireproof construction with exterior brick walls of rough red tapestry brick about 9 inches long and 1¾ inches thick, and laid in Flemish bond with two stretchers and a header with blind joint between stretchers. Mortar joints are one inch thick. All interior walls are of brick or terra cotta tile and floors of reinforced concrete and terra cotta tile. The roof is covered with one-half inch sea-green slates of rough texture.

## EDITORIAL COMMENT

AS the figures of enlistments among the professions are tabulated, it is seen that the percentage of men in service from the architectural profession stands very high. This is a fine example of patriotism of which architects may be justly proud. There are a number of conditions which make army or navy service of particular interest to the younger architects and draftsmen if reasons other than duty to the nation are needed. The war offers a great opportunity to visit the Old World, which always holds a strong attraction for architects, and the development of modern warfare has opened so many possibilities in engineering and construction necessary to support the army in the field that the architect readily finds himself of direct and almost immediate value in the carrying on of this work. The fascination of outwitting the enemy by clever disguises for moving troops and heavy guns, through color and design, makes a strong appeal to the artistic sense of American architects and painters, just as it did to the Europeans. A full company now studying the art of camouflage in Washington was largely recruited from the ranks of architects, artists, and sculptors in New York City alone.

It is unquestionably our present duty to aid the Government in every way that lies in our power in its prosecution of the war, and the spirit which architects have already manifested leaves no doubt as to their very live patriotism. While nothing should at this time be given precedence over our nation's stand for world democracy, it is well for us to remember that there is a future ahead. The day of peace will come in due course and with it many new problems that will tax our ingenuity fully as much as the difficult ones we now face. There is a serious aspect to the architectural profession in the large enlistments of young men that will have its effect in the years of reconstruction to follow the war. At the present time their greatest service is unquestionably to the nation, and while some may think it fortunate there is this opportunity to take up the slack that is naturally occurring in the building world, it is a fact that at present so many have entered the service there is a noticeable lack of draftsmen to meet the needs of present necessary work. As a single instance of the number of men so engaged, the case of the Boston Architectural Club may be cited. Out of a comparatively small membership, sixty men have joined the forces. The same con-

dition is noted among other architectural societies throughout the country. The enrolment in the architectural schools is another evidence of the presence of war. The classes show memberships of 50 per cent and more below the normal registration. In the medical profession this condition, of course, is also apparent, and due to the recognized necessity of maintaining the supply of physicians medical students have been discouraged from enlisting in the thought that their greater value lies in preparing to practise their profession. The need for architects can hardly be considered on the same plane of necessity as for doctors, but the ultimate effect in one profession will nevertheless be the same as in the other.

Furthermore, many of the men now in military service will not return to the profession — some will, if the war continues, be called upon to make the supreme sacrifice of their lives; others through their changed environment will find within themselves new resources that will lead them to other callings when they resume civil life. In any event, the outcome will be a very evident diminution in the ranks of architects, and at a time when the need for architects will probably be greater than this country has ever before experienced.

The remedy lies only in a greater cultivation of our present resources, so that what will be lost in numbers of men may be offset by a greater efficiency among those remaining to carry on the profession. After the war this country will take an enormous part in restoring the industries, property, and wealth which have been destroyed in the past three years. The demands that will be placed upon us to provide buildings that will serve our business interests and restore to a normal ratio the housing quarters of the people, will require the services of a body of architects capable of directing large enterprises with speed, efficiency, and full confidence in their abilities.

### A CORRECTION

THE author and editors regret that through an error the design of the additions to the Polytechnic Elementary School at Pasadena, Cal., appearing in the article, "One-Story and Open-Air Schoolhouses in California," in our July issue, was credited to Mr. Elmer Grey. Mr. Myron Hunt was the architect of this work and credit should have been given to him.





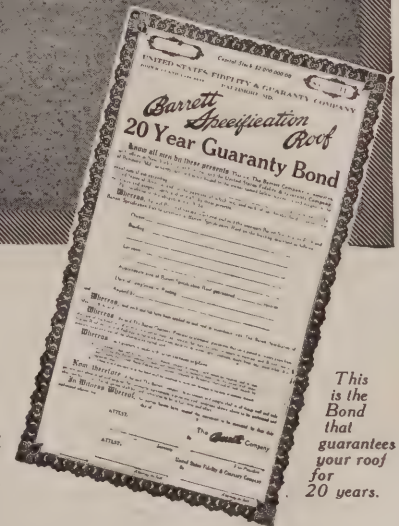
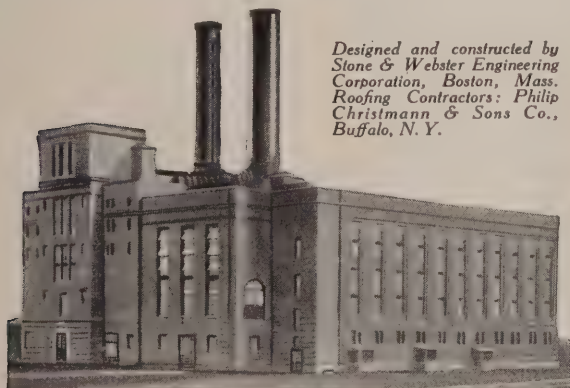
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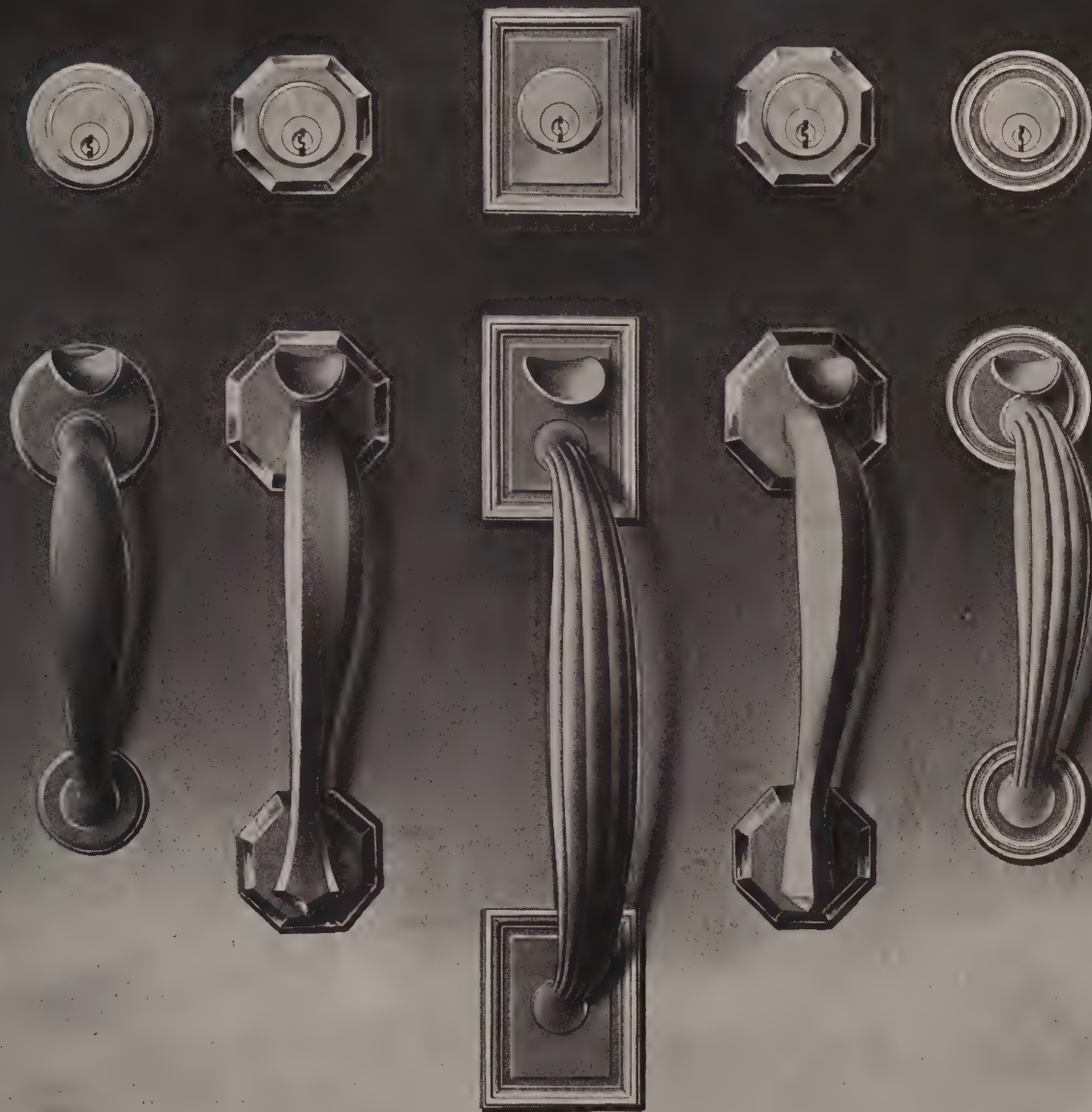
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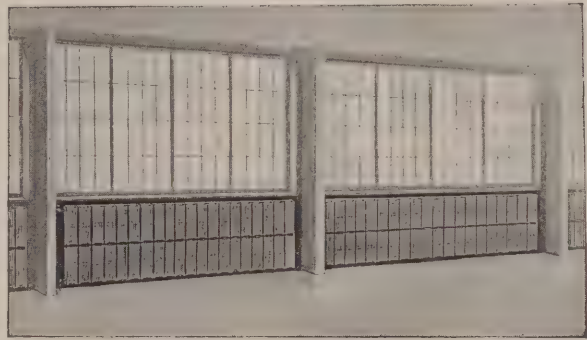
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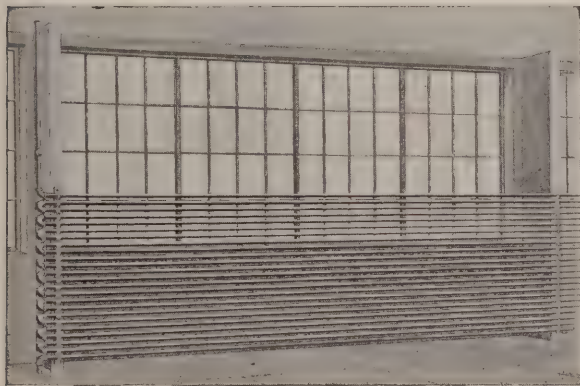
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# Selected List of Manufacturers' Publications

FOR THE SERVICE OF ARCHITECTS, ENGINEERS, AND CONTRACTORS

The publications listed in these columns are the most important of those issued by manufacturers represented in the advertising pages of THE ARCHITECTURAL FORUM. They may be had upon direct application to the manufacturers.

## ARCH CONSTRUCTION, TIMBREL TILE

**Guastavino Co., R.**, Fuller Building, New York, N. Y.  
Portfolio. 10½ x 13½ in. Plates.

## BRICK

**American Enameled Brick and Tile Co.**, 52 Vanderbilt Avenue, New York.  
Enameled Brick. Catalog. 6 x 9½ in. 25 pp. Color plates.

**Claycraft Brick Co.**, 907 Hartman Building, Columbus, Ohio.  
Booklet. 6 x 9 in. 39 pp. Plates showing examples of work.

**Hydraulic-Press Brick Co.**, St. Louis.  
Bonds and Mortars in the Wall of Brick. Treatise on brick design. 8½ x 11½ in. 27 pp.  
Brick Scales and Tables. Fifteen scales for vertical and horizontal measurements, with explanatory booklet and tables. 8 x 10 in. 32 pp.  
Moulded and Ornamental Brick. Catalog. 4½ x 6½ in. 140 pp.  
The Hy-tex House of Moderate Cost. Booklet. 8 x 10½ in. 100 pp. 80 sketch plans and elevations.  
The Brick Church and Parish House. Book of designs with floor plans from drawings submitted in competition. 10½ x 13½ in. 80 pp.

**Sayre & Fisher Co.**, 261 Broadway, New York.  
Brick — Enameled and Front. Catalog. 6 x 9 in. 24 pp. Color plates.

**Western Brick Co.**, Danville, Ill.  
The Art of Stippling. Brochure giving history of development of stippling and its application to face brick. 4 x 6 in. 24 pp.

## CEMENT, PORTLAND

**Atlas Portland Cement Company, The**, 30 Broad Street, New York.  
Handbook and Treatise. Concrete in Factory Construction. 6½ x 8½ in. 250 pp.  
Early Stucco Houses, with modern stucco specifications. Booklet. 8½ x 11 in. 24 pp.  
Choosing the Garage, describing actual construction. Booklet. 8 x 10½ in. 26 pp.  
Commercial Garages, with construction notes and architectural treatment. Booklet. 8 x 10½ in. 12 pp.  
Color Tones in Stucco. Booklet with colored plates. 8½ x 11 in. 24 pp.  
Building a Bungalow. Booklet. 8½ x 11 in. 18 pp. 4 color plates.

**Lehigh Portland Cement Co., The**, Allentown, Pa.  
Forty-one Concrete Reasons. Booklet. 6 x 9 in. 34 pp.  
Cement Facts. Booklet. 5½ x 6½ in. 18 pp.  
The Expense-Proof Farm. Booklet. 6 x 9 in. 100 pp.  
Lehigh Portland Cement. Illustrated. Booklet. 8½ x 12½ in. 42 pp.

**Sandusky Cement Co., The**, Dept. S., Engineers Building, Cleveland, Ohio.  
Medusa White Portland Cement. Booklet. 8½ x 11 in. 52 pp.  
Medusa Waterproofed White Portland Cement. Booklet. 6 x 9 in. 20 pp.  
Medusa Waterproofed Gray Portland Cement. Booklet. 6 x 9 in. 20 pp.

## CHIMNEYS

**Heinicke, Inc., H. R.**, 147 Fourth Avenue, New York.  
Chimneys. Bulletin. Methods of construction.

## CONDUIT

**National Metal Molding Co.**, 1113 Fulton Building, Pittsburgh.  
Handbook on National Metal Molding. Complete details and installation instructions. 4½ x 6 in. 96 pp.  
Bulletin No. 50. Rigid Conduits. 8½ x 11 in. 12 pp.

## CONSTRUCTION, FIREPROOF

**General Fireproofing Co., The**, Youngstown, Ohio.  
Fireproofing Handbook. 6 x 9 in. 112 pp.

## CONVEYORS, GRAVITY

**Otis Elevator Company**, Eleventh Avenue and 26th Street, New York.  
Otis Gravity Conveyors. Catalog. 6 x 9 in. 56 pp.

## DOORS, WINDOWS, AND TRIM, METAL

**Detroit Steel Products Co.**, 2917 East Grand Boulevard, Detroit, Mich.  
The Fenestra Line. Catalog. 8½ x 11 in. 15 sections. Blue prints.

**Lupton's Sons Co., David**, Witte and Tulip Streets, Philadelphia, Pa.  
Lupton Service and Products. No. 9. Descriptive catalog with drawings and data for specifications. 8½ x 11 in. 100 pp. and cover.

## DOORS, WINDOWS, AND TRIM, METAL—Continued

**Merchant & Evans Co.**, Philadelphia.  
Red Book. Catalog. 5½ x 8½ in. 190 pp.

**Trussed Concrete Steel Co.**, Steel Sash, Dept. 57, Youngstown, Ohio.  
United Steel Sash. Catalog. Details and specifications. 8½ x 11 in. 128 pp.

## DUMBWAITERS

**Sedgwick Machine Works**, 182 Liberty Street, New York.  
"Service Sheets." Standard specifications, plans, etc. 16½ x 21½ in.

## ELECTRICAL EQUIPMENT

**Hart & Hegeman Mfg. Co., The**, 346 Capitol Ave., Hartford, Conn.  
Catalog O. H & H Switches and Paiste Wiring Material. 9 x 10½ in. 106 pp.

**Hart Mfg. Co.**, Hartford, Conn.  
"Diamond H" Switches and Receptacles. Descriptive booklet. 4 x 8½ in. 24 pp.

## ELEVATORS

**Otis Elevator Company**, Eleventh Avenue and 26th Street, New York.  
Otis Electric Traction Elevators. Bulletin. 6 x 9 in. 28 pp.  
Otis Residence Elevators. Bulletin. 6 x 9 in. 16 pp.

**Sedgwick Machine Works**, 182 Liberty Street, New York.  
Selecting an Invalid Elevator. Booklet. 4½ x 8½ in. 8 pp.

## ESCALATORS

**Otis Elevator Company**, Eleventh Avenue and 26th Street, New York.  
Otis Escalators. Bulletin. 6 x 9 in. 36 pp.

## FAIENCE, ARCHITECTURAL

**Rookwood Pottery Co.**, Cincinnati.  
Faience Catalog with portfolio of plates. 9½ x 12½ in. 64 pp.

## FLOORING

**Armstrong Cork & Insulation Co.**, 132 24th St., Pittsburgh.  
Linotile Floors. Booklet. 6 x 9 in. 32 pp.

**Kennedy, Inc., David E.**, 55 Fifth Avenue, New York.  
Nonpareil Cork Tile. Booklet showing patterns. 3½ x 5½ in. 34 pp.  
Folder showing colors of tiles. 3½ x 5½ in. 4 pp.  
Everlastic Tile. Folder. 3½ x 6½ in. 4 pp.  
Mas-Oleum Floor. (Mastic Linoleum.) Folder. Specification Forms. 7½ x 9 in. 4 pp.

**Sonneborn Sons, Inc., L.**, Dept. 4, 264 Pearl Street, New York.  
Lapidolith Specifications. Booklet. 8½ x 10½ in.  
Scientific Investigation of the Action of Lapidolith on Concrete by Prof. R. J. Colony. Booklet.

## GARDEN POTTERY—See Pottery, Garden.

## GLASS CONSTRUCTION

**Berger Manufacturing Co.**, Canton, Ohio.  
Berger's Raydiant Sidewalk Lights. Catalog T. F. 8½ x 11 in. 42 pp.

**Keppler Glass Constructions Inc.**, Architects Building, 101 Park Avenue, New York.  
Bulletin No. 126. 8½ x 11½ in. 12 pp.  
Bulletin No. 202. 9 x 12 in. 6 pp.  
Bulletin No. 203. 9 x 12 in. 4 pp.  
Bulletin No. 205. 9 x 12 in. 6 pp.

**Lord & Burnham Co.**, 42d Street Building, New York.  
Some Greenhouses We Have Built. Illustrations. Completed work. Catalog. 9½ x 12½ in. 98 pp.

## HARDWARE

**Columbian Hardware Co., The**, Cleveland, Ohio.  
Making It Easier to Buy Columbian Sash Pulleys. Folder. 3½ x 8½ in. 14 pp.

**Corbin, P. & F.**, New Britain, Conn.  
Colonial Hardware. Booklet. 5 x 7 in. 32 pp.  
Corbin Door Checks. Catalog. 5 x 7 in. 40 pp.  
Corbin Door Knockers. Booklet. 5 x 7 in. 24 pp.  
General Catalog. 10½ x 13 in. 1200 pp.



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SELECTED LIST OF MANUFACTURERS' PUBLICATIONS — *Continued from page 26***HARDWARE — Continued**

- Reliance Ball Bearing Door Hanger Co.**, Grand Central Terminal Building, New York.  
Door Hangers, etc. Catalog. 8 x 9½ in. 32 pp.
- Russell & Erwin Mfg. Co.**, New Britain, Conn.  
General Catalog. 9 x 12 in. 1250 pp.  
Russwin Period Design Booklet. 6 x 8 in. 72 pp.  
Russwin Fire Exit Bolt Catalog. 6 x 9 in. 46 pp.  
Russwin Monograph (28 subjects). 3½ x 6 in. 6 pp.
- Stanley Works, The**, New Britain, Conn.  
Wrought Hardware. Catalog. Describing wrought steel hinges, butts and door bolts. 6½ x 10 in. 260 pp.  
Stanley's Wrought Steel Garage Door Hardware. Booklet. 3½ x 6¼ in. 8 pp.  
Properly Hung Doors. Booklet. 5 x 7½ in. 16 pp.  
"Stanley" Sherardizing. Descriptive booklet. 3½ x 6¼ in. 4 pp.
- Vonnegut Hardware Company**, Indianapolis.  
Von Duprin Self-Releasing Fire Exit Device. Catalog 12F.

**HEATING EQUIPMENT**

- American Blower Co.**, Detroit, Mich.  
"A B C" Heaters. Bulletin. 8½ x 11 in. 24 pp.  
Vento Cast-Iron Hot-Blast Heater. Bulletin. 8½ x 11 in. 44 pp.
- American Radiator Co.**, 816 S. Michigan Avenue, Chicago.  
The Ideal Fitter. Handbook with specification data. 6½ x 3¾ in. 336 pp.
- Boynton Furnace Co., The**, 106 West 37th Street, New York.  
Square Pot Heaters. Catalog. 7 x 9¼ in. 60 pp.
- Crane Co.**, 836 South Michigan Avenue, Chicago.  
Steam Goods. Complete pocket catalog. 4½ x 6 in. 620 pp.
- Fulton Company, The**, Knoxville, Tenn.  
Catalog D. 7 x 10¼ in. 22 pp.  
The Ja-Nar'. Catalog. Color plates and specification data. 8½ x 11 in. 20 pp.
- Gorton & Lidgerwood Co.**, 96 Liberty Street, New York.  
Modern House Heating. Catalog No. 88. 4¼ x 7 in. 32 pp.
- Jenkins Bros.**, 80 White Street, New York.  
Catalog and Price List. 4 x 6¼ in. 256 pp.
- Kelsey Heating Co., The**, 238 James Street, Syracuse, N. Y.  
Architects' Portfolio. 12 plates showing plans, heating, specifications, and layouts. 8½ x 11 in.  
Kelsey System of Heating and Ventilating. Booklet. 36 pp.  
Kelsey Warm Air Generators. Booklet. 32 pp.
- Lord & Burnham Co.**, 42d Street Building, New York.  
Burnham Boilers. Catalog No. 56. 4 x 10 in. 19 pp.
- Sturtevant Co., B. F.**, Dept. B, Hyde Park, Boston, Mass.  
Heating and Ventilation. Treatise. 6½ x 9 in. 325 pp.  
Heating and Ventilating Layouts. Blue print book. Bulletin No. 227. 8½ x 11 in. 28 pp.  
Sturtevant Heaters. A book for architects. 8½ x 11 in. 32 pp.
- United States Radiator Corporation**, Detroit.  
A Modern "House Warming." Booklet. 6 x 9 in. 30 pp.  
The "Complete Line." Technical data. Catalog. 4¼ x 7¼ in. 270 pp.

**HOISTS**

- Gillis & Geoghegan**, 544 West Broadway, New York.  
The G. & G. Telescopic Hoist (all models). Booklet A. 8½ x 11 in. 16 pp.

**HOLLOW TILE — See Tile, Hollow****INSULATION**

- Armstrong Cork & Insulation Co.**, 132 24th Street, Pittsburgh.  
Nonpareil Corkboard Insulation. Scientific treatise. 6 x 9 in. 130 pp.  
Nonpareil High Pressure Covering. Scientific treatise. 6 x 9 in. 84 pp.
- Cabot, Inc., Samuel**, 141 Milk Street, Boston.  
"Service Sheets." Details of Construction and Methods of Using Cabot's Quilt. 16½ x 21½ in.
- Johns-Manville Co., H. W.**, Madison Avenue, New York.  
J-M Keystone Hair Insulator. Booklet. 6 x 9 in. 16 pp.  
How to Reduce Coal Bills 25 Per Cent. (J-M Asbestocel Pipe Covering.) Booklet. 3½ x 6 in. 8 pp.

**JOISTS AND STUDS, PRESSED STEEL**

- Berger Manufacturing Co.**, Canton, Ohio.  
Metal Lumber. Series of technical bulletins 12F especially prepared for architects. 8½ x 11 in. 32 pp.  
Riblex, Bulletin No. 14. 8½ x 11 in. 4 pp.
- Trussed Concrete Steel Co.**, Dept. B-57, Youngstown, Ohio.  
Kahn Pressed Steel Construction. Catalog. Complete details and specifications. 8½ x 11 in. 32 pp.

**LATH, METAL**

- Berger Manufacturing Co.**, Canton, Ohio.  
Berger's Expanded Metal Lath. Booklet. 3½ x 6 in. 44 pp.  
Supplement. 24 pp.

**LATH, METAL — Continued**

- General Fireproofing Co., The**, Youngstown, Ohio.  
Herringbone Rigid Metal Lath. A complete catalog on Herringbone Metal Lath. 6 x 9 in. 32 pp.
- North Western Expanded Metal Co.**, 934 Old Colony Building, Chicago, Ill.  
Kno-Burn Expanded Metal Lath. Treatise on metal lath, with details and specifications. 6 x 9 in. 52 pp.  
"Chanelath" Handbook. Treatise on ribbed metal lath details and specifications of its application to reinforced concrete construction and for plastering. 6 x 9 in. 64 pp.
- Trussed Concrete Steel Co.**, Dept. H-57, Youngstown, Ohio.  
Hy-Rib Handbook. Specifications. 5½ x 7¼ in. 142 pp.
- Wright Wire Co.**, Worcester, Mass.  
General Catalog. Description and full particulars of wire lath, wire fencing, ornamental iron work, elevator cabs, railings, partitions, and grille work. 6 x 9 in. 224 pp.  
Wire Lath. Booklet L. Shows where Wright wire lath has been used. 3½ x 6½ in. 16 pp.

**LIGHTING EQUIPMENT**

- Ivanhoe-Regent Works of General Electric Co.**, Cleveland.  
Regent Semi-Indirect Lighting Bowls. Catalog No. 108. 8 x 10½ in. 48 pp.  
Holophane Prismatic Reflectors and Fittings. Catalog No. 800. 4 x 7 in. 50 pp.  
Ivanhoe Metal Reflectors and Fittings. Catalog No. 303. 4 x 7 in. 50 pp.  
Rozelle Color-Decorated Bowls and Shades. Catalog No. 235. 8 x 10½ in. 16 pp.
- Luminous Unit Co.**, St. Louis.  
Brascolite — The Modern Semi-Indirect Lighting System. Catalog No. 5. 8¼ x 10¼ in. 24 pp.  
Brascolite Data. Scientific data sheets. Portfolio. 9 x 11½ in. Blue prints.  
Agilites. Folder catalog. All-glass lighting fixtures. 5¼ x 8 in. 8 pp.
- McFaddin & Co., H. G.**, 42 Warren Street, New York.  
Emeralite. Booklet. Colored plates. 3½ x 6¼ in. 32 pp.
- National X-Ray Reflector Co.**, 243 West Jackson Boulevard, Chicago.  
Engineering Data Book. Technical handbook. 6 x 9 in. 125 pp.  
Illumination from Concealed Sources — How to Plan and Specify Indirect Lighting. Scientific treatise. 12 x 15 in. 52 pp. 36 detail drawings.
- St. Louis Brass Mfg. Co.**, St. Louis.  
"Concealite" Catalog A. Lighting fixtures for auditoriums, banks, show windows, etc., from concealed or semi-concealed sources. 7½ x 10½ in. 20 pp.

**METAL LATH — See Lath, Metal.****METAL TRIM — See Doors, Windows, and Trim, Metal.****METAL WORK, ORNAMENTAL**

- Gorham Co. Architectural Bronze, The**, Fifth Avenue and 36th Street, New York.  
Architectural Mouldings and Rosettes. Catalog. 9¼ x 12½ in. 16 plates.  
"Service Sheets." 16½ x 21½ in.
- Polachek Bronze and Iron Co., John**, 480-494 Hancock Street, Long Island City, N. Y.  
Distinctive Metal Work. Booklet. 8½ x 11 in. 6 pp.
- Smyser-Royer Company**, 1225 Race Street, Philadelphia, Pa.  
Portfolio illustrating standards and other exterior lighting fixtures. 4½ x 10¼ in. 175 pp. thus far.
- Tuttle & Bailey Mfg. Co.**, 52 Vanderbilt Avenue, New York.  
Special Designs of Grilles and Screens in Bronze, Brass, Iron, and Steel. Catalog No. 66A. 6½ x 10 in. 40 pp.
- Winslow Bros. Company**, 4600-4700 West Harrison Street, Chicago.  
P. O. Box No. 803.  
Ornamental Iron and Bronze. Illustrations of completed work. 8½ x 11 in. 300 pp.

**OFFICE SUPPLIES, ARCHITECTS'**

- Dixon Crucible Co., Joseph**, Dept. 224-J, Jersey City, N. J.  
"Eldorado" — The Master Drawing Pencil. Booklet.

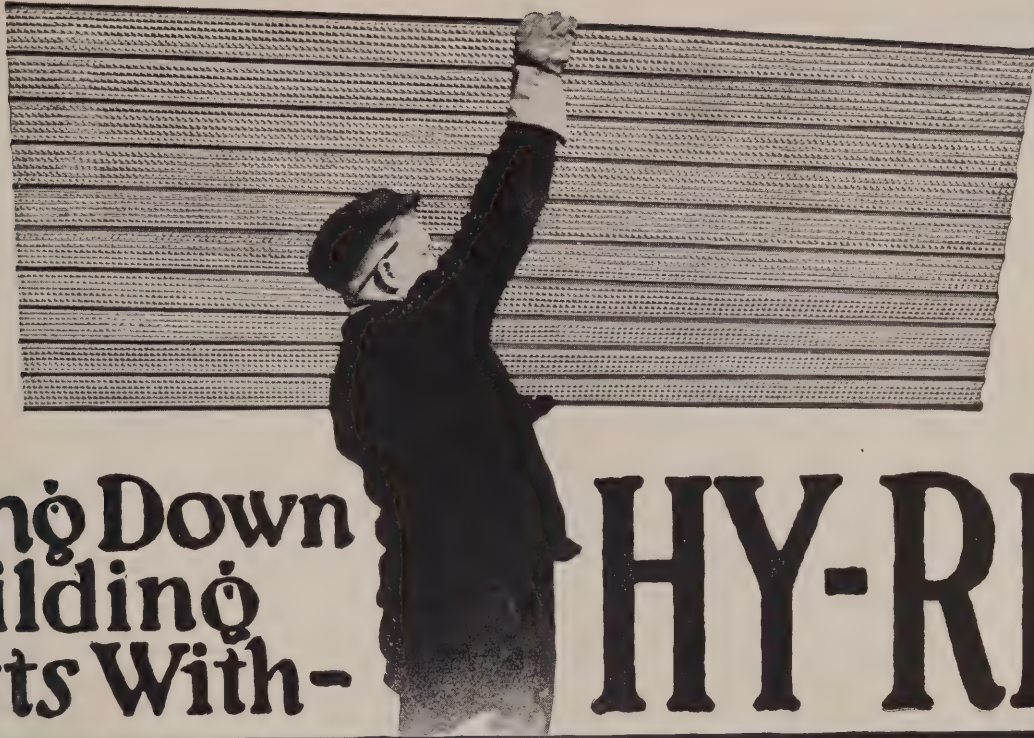
**ORNAMENTS, PLASTIC**

- Jacobson & Company**, 241 East 44th Street, New York.  
Architectural and Decorative Ornaments. Catalog. 9¼ x 12½ in. 192 pp.

**PAINTS, VARNISHES, AND WOOD FINISHES**

- Berry Bros.**, Detroit, Mich.  
Natural Woods and How to Finish Them. Complete varnish specifications. 4¼ x 6½ in. 94 pp.  
Luxeberry Cement Coating. Color card. 3½ x 8½ in. 3 pp.





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## SELECTED LIST OF MANUFACTURERS' PUBLICATIONS—Continued from page 28

## PAINTS, VARNISHES, AND WOOD FINISHES—Continued

- Boston Varnish Co.,** Everett Station, Boston.  
Kyanize Enamel. Specifications. Booklet. 5 x 7 in. 20 pp.  
Kyanize White Enamel. Directions. Circular. 3½ x 6 in. 8 pp.  
Price List of Varnishes and Enamels. 3½ x 6 in. 24 pp.
- Dixon Crucible Co., Joseph,** Dept. 224-J, Jersey City, N. J.  
Philosophy of Protective Paint. 3¼ x 6¼ in. 24 pp.
- Lowe Bros. Co., The,** 101 Park Ave., New York and Dayton.  
Architects' Mellotone Handbook. 3 x 8 in. 27 pp. Color plates.  
High Standard Paint and Varnish Specifications. Handbook. 4½ x 7 in. 70 pp.  
Paint and Painting. Directions and data. 5 x 9 in. 30 pp.  
Varnish and Varnishing. Treatise. 5 x 9 in. 44 pp.
- Murphy Varnish Co.,** Newark, N. J.  
The House that Found Itself. Booklet. 6¼ x 9¼ in. 28 pp.  
Harmony in Interior Decoration. Booklet. 5¼ x 8¼ in. 56 pp.  
Dealer's Descriptive List. Booklet. 4½ x 6¼ in. 28 pp.  
Beautiful Boats and How to Care for Them. Booklet. 5¼ x 8¼ in. 50 pp.
- O'Brien Varnish Company, The,** 40 Washington Street, South Bend, Ind.  
Specification Data. Information concerning O'Brien line of varnishes and interior finishes. 8½ x 11 in.
- Smith & Co., Edward,** P. O. Box 1780, New York.  
Architects' Handbook. Specifications. 5 x 7½ in. 24 pp.
- Toch Brothers,** Dept. 97, 320 Fifth Avenue, New York.  
Specifications for Damp-proofing, Waterproofing, Enameling, and Technical Painting. 8¼ x 11½ in. 48 pp.  
Toch Brothers Preservative Paints and Compounds. Booklet. 5½ x 8¼ in. 36 pp.
- Wadsworth, Howland Co., Inc.,** 139 Federal Street, Boston.  
Bay State Finishes, Stains, and Varnishes. Catalog No. 10. Color cards.

## PARTITIONS, FOLDING AND ROLLING

- Folding Partition Co., Inc.,** 200 Broadway, New York, N. Y.  
Sectionfold Partitions. Catalog with detail sheet. 20 x 27 in.

## PILES

- MacArthur Concrete Pile and Foundation Co.,** 120 Broadway, New York.  
The Pedestal Pile. Catalog. Engineering data. 6 x 9 in. 64 pp.
- Raymond Concrete Pile Co.,** 140 Cedar Street, New York.  
Raymond Concrete Piles. Catalog. 8½ x 11¼ in. 56 pp.

## PIPE

- Byers Company, A. M.,** 235 Water Street, Pittsburgh.  
Bulletin No. 26. Tables and Specifications. Bulletin (2d Edition, Enlarged and Revised). 8½ x 11 in. 24 pp.  
Bulletin No. 27. The Experience of Practical Men. 8½ x 11 in. 40 pp.  
Selection of Pipe for Modern Buildings. Booklet of special interest to architects. 4 x 6 in.  
On the Trail of Byers Pipe. Booklet. 4 x 6¼ in. 46 pp.
- Central Foundry Company,** 90 West Street, New York.  
Soil Pipe and Fittings. Catalog. 4 x 7½ in. 88 pp.  
The Lynn Drain Trap. A leaflet containing description.  
Combination Vent, Revent, and Drainage Fittings. Catalog. 4¼ x 6¼ in. 183 pp.
- National Tube Company,** Frick Building, Pittsburgh, Pa.  
Shelby Mechanical Tubing. Booklet. 3½ x 6 in. 35 pp.  
Boiler Tubes List No. 6, 1916. Booklet. 4 x 6¼ in. 16 pp.  
Pipe List No. 5, 1913. Booklet. 4 x 6¼ in. 20 pp.  
National Bulletins, Nos. 1 to 27, inclusive. 8½ x 11 in.  
National Pipe Standards. Booklet. Appendix to 1913 edition. Tables and useful information pertaining to tubular goods. 4 x 6½ in. 400 pp.

## PLASTER

- Hydrated Lime Bureau of the National Lime Manufacturers' Association,** 1506 Arrott Bldg., Pittsburgh.  
Standard Specifications for Hydrated Lime Plastering. Pamphlet E. 6¼ x 9¼ in. 20 pp.  
Better Plastering and Better Acoustics. Bound booklet. 6¼ x 9¼ in. 40 pp.  
Better Methods in Concrete Construction. Bulletin No. A-5. Treatise on the use of hydrated lime in concrete. 6 x 8 in. 16 pp.
- Kelley Island Lime & Transport Co.,** Cleveland, Ohio.  
Specifications for Hydrated Lime Plastering. Booklet. 6 x 9 in. 20 pp.  
Hydrated Lime Plaster. Booklet. 6¼ x 9¼ in. 12 pp.  
Tiger Tales. Booklet. 4 x 8 in. 12 pp.  
The Perfect Finishing Lime. Booklet. 4½ x 7¼ in. 34 pp.

## PLUMBING EQUIPMENT

- Crane Co.,** 836 South Michigan Avenue, Chicago.  
Catalog. 9 x 12 in. 834 pp.
- Kohler Co.,** Kohler, Wis.  
Kohler Catalog. Cloth bound. 9½ x 11¼ in. 164 pp.
- Standard Sanitary Mfg. Co.,** Dept. 4, Pittsburgh, Pa.  
"Standard" Catalog. General catalog of "Standard" line. 9 x 12 in. 676 pp.  
"Standard" Plumbing Fixtures for the Home. Catalog.  
Factory Sanitation. Catalog and scientific treatise. 9 x 12 in. 36 pp.

## PLUMBING EQUIPMENT—Continued

- Trenton Potteries Co.,** Trenton, N. J.  
Bathrooms of Character. Booklet. 4 x 7¼ in. 48 pp.  
Sanitary Pottery. Monthly house organ. 6 x 9 in. 16 pp. Color plates.

## POTTERY, GARDEN

- Atlantic Terra Cotta Company,** 1170 Broadway, New York.  
Garden Pottery. Catalog. 9 x 12 in. 12 pp.

## PUMPS

- Goulds Manufacturing Co.,** Seneca Falls, N. Y.  
All Types of Centrifugal and Reciprocating Power Pumps. Bulletins. 20 sections. 7¼ x 10 in.  
Handy Data on Power Pumping. Bulletin 118. 7¼ x 10 in. 24 pp.

## ROOFING

- American Sheet & Tin Plate Co.,** Frick Building, Pittsburgh.  
Copper—Its Effect Upon Steel for Roofing Tin. Scientific treatise. New edition. 8¼ x 11 in. 24 pp.  
Pocket Reference Book. 2½ x 4¼ in. 168 pp.
- Barrett Company, The** (formerly The Barrett Mfg. Company). 17 Battery Place, New York City.  
Barrett's Specification Roofs—20-Year Guaranty Bond. Loose-leaf specifications with details. 8½ x 14 in.  
Foundation Waterproofing. Loose-leaf specifications. 8½ x 14 in.  
Tylike Shingles with Red or Green Crushed Slate Surface. For residences, etc. Descriptive booklet. 6 x 8 in.  
Velvex Creosote Shingle Stains. Descriptive folder showing colors on wood. 3½ x 6½ in.
- Boyle & Co., Inc., John,** 112-114 Duane Street, New York.  
Opinions of Practical Builders. Instructions for using Bayonne Roof and Deck Cloth. Book S. 3½ x 6 in. 24 pp.
- Carey Co., The Philip,** Lockland, Cincinnati.  
Architects' Book of Carey Roofing Specifications.
- Creo-Dipt Co.,** 1025 Oliver Street, North Tonawanda, N. Y.  
"Service Sheet" 1. No. 28. Working Drawings of Construction of "Thatch" Roof. Standard specifications and instructions for design and construction of same. 16½ x 21½ in.
- General Slate Company,** 200 Devonshire Street, Boston.  
General Slate Company—Roofing Slate. Booklet. 6 x 9 in. 16 pp.
- Johns-Manville Co., H. W.,** Madison Avenue, New York.  
J-M Corrugated Asbestos Roofing. Catalog. 6 x 9 in. 32 pp.  
J-M Transite Asbestos Shingles. Catalog. 6 x 9 in. 32 pp.
- Ludowici-Celadon Company,** 104 South Michigan Avenue, Chicago.  
Roofing Tile. A detailed reference for architects. 9¼ x 13½ in. 106 pp.  
Roofing Tile Catalog. 3¼ x 9 in. 10 pp.  
The Roof Beautiful. Booklet. 6¼ x 9¼ in. 40 pp. Color plates.  
Why Tile Is Best. Booklet. 3¼ x 6¼ in. 8 pp.
- Taylor Co., N. & G.,** 300 Chestnut Street, Philadelphia.  
A Guide to Good Roofs. Booklet. 3¼ x 5½ in. 24 pp.  
Selling Arguments for Tin Roofing. Booklet. 6 x 9¼ in. 80 pp.  
"Service Sheets." Working drawings showing details of construction of heavy ribbed and standing seam tin roofing; also color suggestions for tin roofs and tables of covering capacity of tin. 16½ x 21½ in.  
Standard Specifications for Tin Roofing Work. 7½ x 9 in.

## STONE

- Indiana Limestone Quarrymen's Association,** P. O. Box 505, Bedford, Ind.  
Indiana Limestone Booklet. Vol. I. 6 x 8¼ in. 40 pp.  
Indiana Limestone Booklet. Vol. IV. Bank Buildings. 6 x 8¼ in. 40 pp.

## STORE FRONTS

- Detroit Show Case Co.,** 467 Fort Street West, Detroit, Mich.  
Metal Store Front Construction. Handbook. 6 x 10 in. 32 pp.  
With full size blue print details. 24 x 36 in.
- Kawneer Manufacturing Co.,** Niles, Mich.  
Architects' Portfolio of Details. 17 full size construction plates, loose leaf. 34 x 44 in. Also 17 half size construction plates, bound. 8½ x 11 in.

## STUCCO BOARD

- Bishopric Manufacturing Co., The,** 910 Este Avenue, Cincinnati, Ohio.  
The Bishopric Mastic Products. Booklet. 6 x 9¼ in. 24 pp. Color plates.  
Built on the Wisdom of Ages. Booklet showing methods of using Bishopric Stucco Board. 8½ x 11 in. 48 pp.  
"Service Sheets." 16½ x 21½ in.

## TELEPHONE SYSTEMS, INTERIOR

- Western Electric Co.,** 195 Broadway, New York.  
Western Electric Interphone Specifications. Handbook. 8¼ x 11 in. 41 pp.





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## SELECTED LIST OF MANUFACTURERS' PUBLICATIONS — Continued from page 30

## TERRA COTTA, ARCHITECTURAL

- American Terra Cotta & Ceramic Co.**, 2010 Peoples' Gas Building, Chicago.  
Specifications for Architectural Terra Cotta and Details of Construction. 14 plates.
- Atlantic Terra Cotta Co.**, 1170 Broadway, New York.  
Atlantic Terra Cotta. Monthly publication. 9 x 12 in. 12 pp.
- Conkling-Armstrong Terra Cotta Co.**, Philadelphia.  
Ornament and Details of Construction. Catalog. 9½ x 13 in.
- Midland Terra Cotta Co.**, 1515 Lumber Exchange Building, Chicago.  
Stock Terra Cotta. Portfolio. 10 x 15 in. 60 plates.
- New Jersey Terra Cotta Co.**, Singer Building, New York.  
The Victoria Building. Booklet. 8½ x 11 in. 10 pp.
- New York Architectural Terra-Cotta Co.**, 401 Vernon Avenue, Long Island City, N. Y.  
Architectural Terra Cotta. Booklet. 8 x 8½ in. 36 pp.
- Northwestern Terra Cotta Co., The**, 2525 Clybourn Avenue, Chicago.  
Architectural Terra Cotta. Booklet. Showing illustrations of buildings and details. 8½ x 11 in. 60 pp.
- South Amboy Terra Cotta Co.**, 150 Nassau Street, New York.  
Plates of Ornamental Detail and Construction. Portfolio.

## TILE, HOLLOW

- National Fire Proofing Co.**, 598 Federal Street, Pittsburgh.  
Builders' Handbook. Details of construction. 8½ x 11 in. 34 pp. Blue prints.
- Fireproof Houses of Natco Hollow Tile. Catalog. 8½ x 11 in. 30 pp.
- Long Span Fireproof Floor Construction. Details, tables, tests. Handbook. 8½ x 11 in. 60 pp. Color plates.
- Natco on the Farm. Catalog. 5½ x 7½ in. 50 pp.

## TILE, STEEL

- General Fireproofing Co., The**, Youngstown, Ohio.  
Steel-Tile Handbook. Tables, formulas, specifications, etc., for tile floors and concrete work. 6 x 9 in. 32 pp.
- Trussed Concrete Steel Co.**, Dept. R-57, Youngstown, Ohio.  
Florestyle Construction. Booklet containing table and full information for specifying. 8½ x 11 in. 16 pp.

## UPHOLSTERY FABRICS

- Chase & Co., L. C.**, 89 Franklin Street, Boston.  
Chase Mohair Velvets. Booklet. Description of fabrics with color reproductions. 9½ x 12½ in. 10 pp.
- Chase Leatherweave. Folder. Descriptive of material and its uses. 3½ x 6½ in.

## VACUUM CLEANERS

- Sturtevant Co., B. F.**, Dept. B., Hyde Park, Boston.  
Sturtevant Vacuum Cleaners. Handbook for architects. No. 248. 8½ x 11 in. 36 pp.
- Western Electric Co.**, 195 Broadway, New York.  
Western Electric Vacuum Cleaner. Specifications. Bulletin. 8½ x 11 in. 62 pp.

## VENETIAN BLINDS

- Wilson Corporation, The, J. G.**, 8 West 40th Street, New York.  
The Lighting and Ventilation of Modern Buildings. Treatise with working drawings. 8½ x 11 in. 12 pp.

## VENTILATION

- American Blower Co.**, Detroit, Mich.  
American Sirocco Fans and Blowers. Bulletin. 8½ x 11 in. 52 pp.
- American Radiator Co.**, 816 So. Michigan Avenue, Chicago.  
"A B C" Steel Plate Fans. Bulletin. 8½ x 11 in. 28 pp. Ventilation by Vento Heaters. Booklet. 8 x 10½ in. 24 pp.
- Clarage Fan Co.**, Kalamazoo, Mich.  
Catalog No. 5. 6 x 9 in. 26 pp.
- Globe Ventilator Co.**, Dept. P, Troy, N. Y.  
Booklet. 4 x 9 in. 36 pp.
- Ohio Blower Co., The**, 5119 Perkins Avenue, Cleveland.  
Gospel of Fresh Air. Booklet. 4 x 9 in. 24 pp.
- Sturtevant Co., B. F.**, Dept. B, Hyde Park, Boston.  
Sturtevant Heaters. Catalog, containing data, curves, tables, and complete layouts for the use of architects in specifying heating and ventilating systems. 8½ x 11 in. 132 pp.
- Auto Force Ventilators. Bulletin No. 232. 8½ x 11 in. 12 pp.

## WALL BOARD

- Carey Co., The Philip**, Lockland, Cincinnati.  
Carey "Ceil-board" for Walls and Ceilings. Specifications. 8 x 11 in. 2 pp.

## WALL COVERINGS

- Standard Oil Cloth Company, Inc., The.**, Dept. I, 320 Broadway, New York.  
Sanitas Modern Wall Covering. Booklet. 5 x 7 in. 28 pp. Color plates.
- Hints to Decorators. Booklet. 5 x 7 in. 12 pp. Colored inserts.
- What They Say About Sanitas. Booklet. 5 x 7 in. 27 pp.
- Selling Helps. Booklet. 5 x 7 in. 24 pp.

## WATERPROOFING

- Anti-Hydro Waterproofing Co.**, 9 Orchard Street, Newark, N. J. (Singer Building, N. Y. C.)  
Concrete Hardener Waterproofing. Booklet. 6½ x 8½ in. 8 pp.

## WATERPROOFING—Continued

- General Fireproofing Co., The**, Youngstown, Ohio.  
Waterproofing Handbook. 6 x 9 in. 88 pp.
- Sandusky Cement Co., The**, Dept. S, Engineers' Building, Cleveland, Ohio.  
Medusa Waterproofing. Booklet. 7 x 9 in. 36 pp.
- Sonneborn Sons, Inc., L.**, Dept. 4, 264 Pearl St., New York.  
Concrete and Lapidolith. Treatise on concrete construction and the use of Lapidolith with it. 5½ x 8½ in. 20 pp.
- Trus-Con Laboratories, The**, 1246 Trus-Con Building, Detroit, Mich.  
Architects' Handbook. 8½ x 11 in. 36 pp.
- Structural Waterproofing. 8½ x 11 in. 52 pp.
- Agatex Book. 5½ x 8 in. 18 pp.
- Descriptive Price List. 3½ x 6½ in. 24 pp.
- Wadsworth, Howland Co., Inc.**, 139 Federal Street, Boston.  
Bay State Brick and Cement Coating. Booklet No. 10. Color plates.

## WATER SYSTEMS

- Armstrong Cork & Insulation Co.**, 132 24th St., Pittsburgh.  
Drinking Water Systems. Treatise. 6 x 9 in. 48 pp.

## WINDOWS, CASEMENT

- Crittall Casement Window Co.**, Detroit, Mich.  
Universal Casements. Catalog No. 15, showing solid steel casement windows. Details. 9½ x 12 in. 64 pp.
- Hope & Sons, Henry**, 103 Park Avenue, New York.  
Casement Windows. Details and sections. Catalog. 10 x 15 in. 187 pp.
- International Casement Co., Inc.**, Jamestown, N. Y.  
Casement Windows and Leaded Glass. Catalog. 10 x 14 in. 56 pp. Plates showing 16th century Tudor residences.

## WIRE FENCES

- Wright Wire Company**, Worcester, Mass.  
Excelsior Rust Proof Fencing. Illustrated and descriptive booklet. 3½ x 6 in. 16 pp.

## WOOD

- Arkansas Soft Pine Bureau**, 1120 Bank of Commerce Building, Little Rock, Ark.  
Architects' Manual. Handbook with grading rules, finishing and painting specifications, and standard moulding designs. 8½ x 11 in. 62 pp.
- "Arkansas Soft Pine—How to Finish and Paint It." Descriptive of wood. Finishing specifications for interior and exterior use. 6½ x 8½ in. 26 pp.
- Not a House but a Home. Home construction hints for the layman. Description of wood, Cottage and residence designs, with introduction by Aymar Embury II, architect. 9 x 12 in. 36 pp.
- Gum Lumber Manufacturers' Association**, 1304 Bank of Commerce Building, Memphis, Tenn.  
Red Gum Facts. Catalog. 5½ x 8½ in. 20 pp.
- Technical Information about Red Gum. Catalog. 5½ x 9 in. 20 pp.
- North Carolina Pine Association**, 83 Bank of Commerce Building, Norfolk, Va.  
Architects' Reference Book. Booklet. 8½ x 11 in. 16 pp. Color plates.
- Home Builders' Book. 5 x 9 in. 24 pp. Color plates.
- Northern Hemlock and Hardwood Mfr's Assn.**, 205 F. R. A. Building, Oshkosh, Wis.  
Birch Interiors. Booklet. 9½ x 12 in. 46 pp.
- Beautiful Birch for Beautiful Woodwork. Leaflet. 8½ x 11½ in.
- Serviceability and Qualities of Birch. Booklet. 8½ x 11 in. 7 pp.
- Rules for the Inspection of Hemlock Lumber. Booklet. 3½ x 6½ in. 32 pp.
- Southern Cypress Manufacturers' Association**, 1234 Hibernia Bank Building, New Orleans.  
Cypress Pocket Library. Covers all uses for cypress. 41 units. 3½ x 5½ in.
- Southern Pine Association**, Dept. M-53, Interstate Bank Building, New Orleans, La.  
Rules for Grading Southern Yellow Pine Timbers. Treatise. 3½ x 6 in. 24 pp.
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- White Pine Bureau**, 2030 Merchants Bank Building, St. Paul, Minn.  
Specification Book—Classified Recommended Uses for White Pine. Illustrating the various standard grades and indicating their proper uses. 8½ x 11 in. 196 pp.
- Three Story Houses of New England. Architectural monograph, Vol. III, No. 1. 8½ x 11 in. 16 pp.
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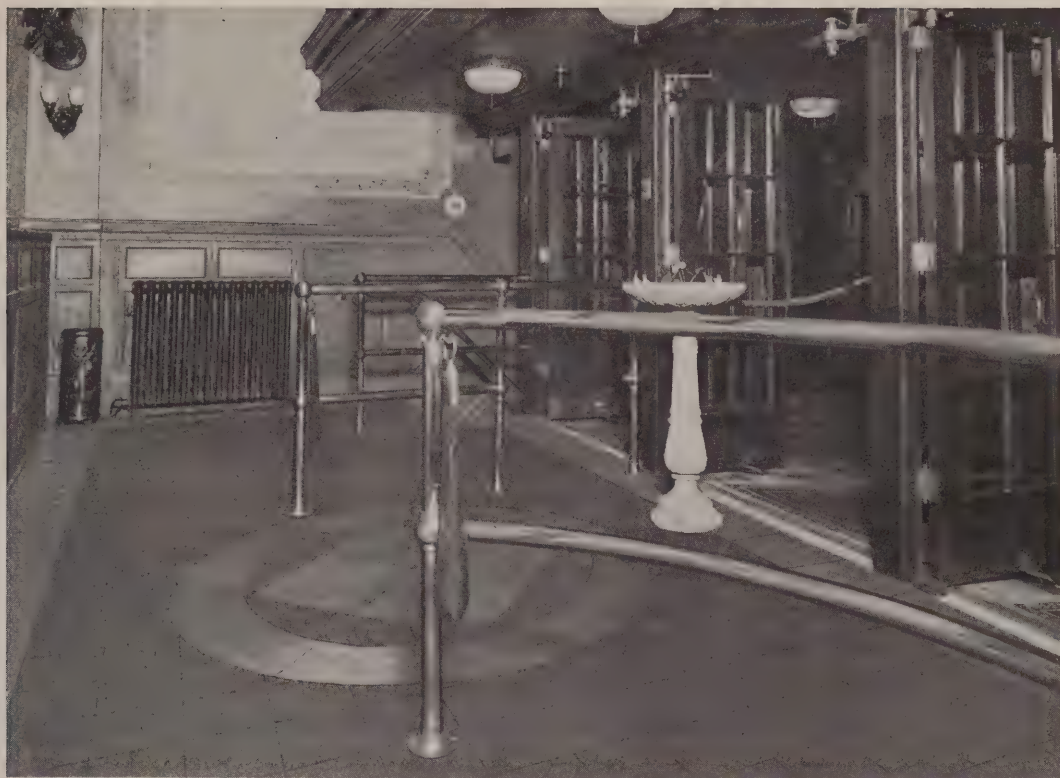
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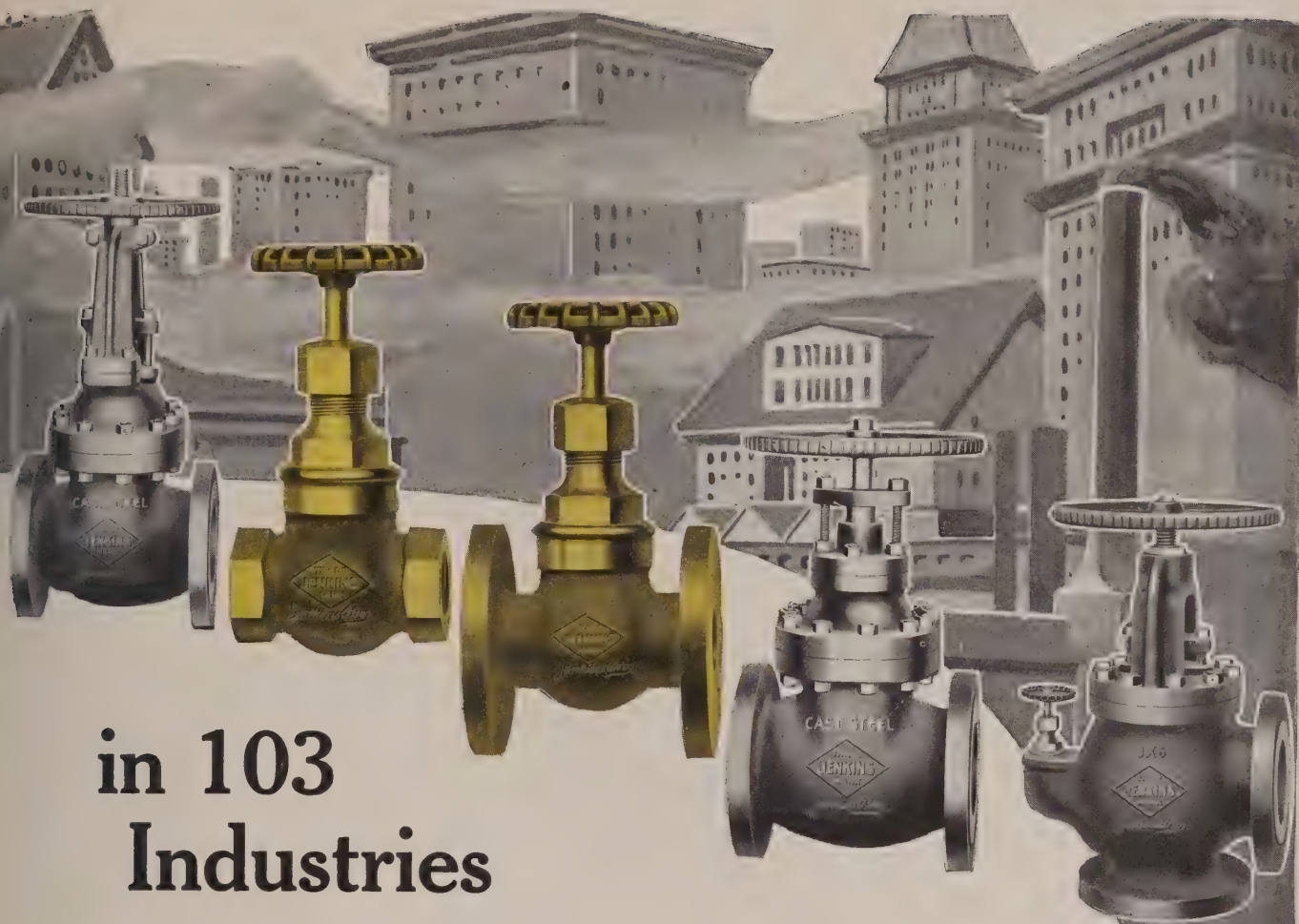
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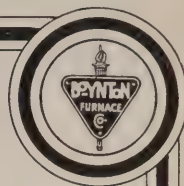
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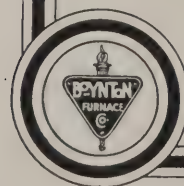
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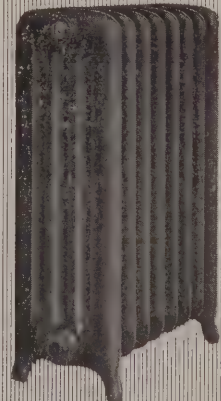
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The servants' quarters are hot water heated.

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A hot water boiler *within the Kelsey* supplies the remote rooms of the servants, which are on *the same floor level with it*.

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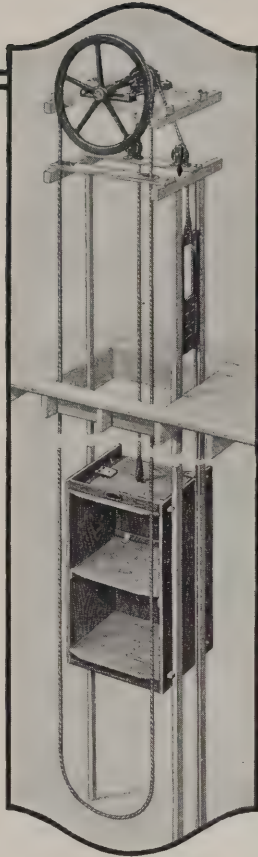
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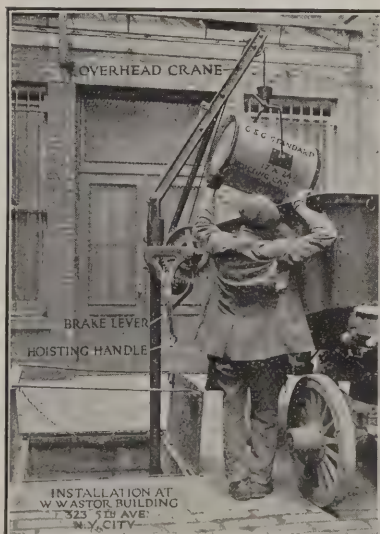
Smooth, easy operation in a dumbwaiter is something the client appreciates more and more as time goes on.

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## PUMPS for BIG buildings

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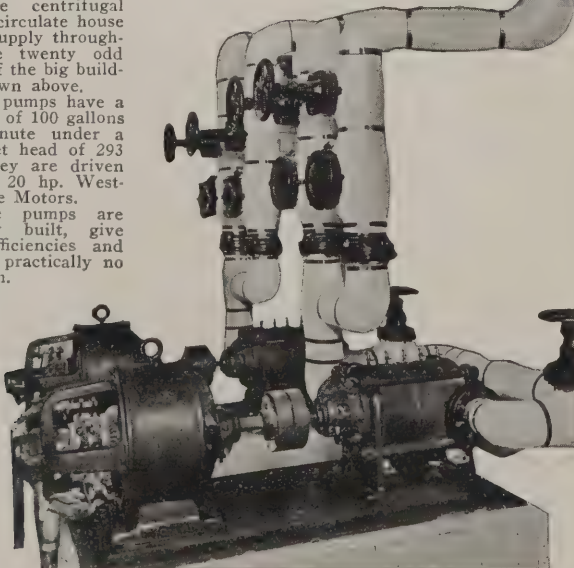


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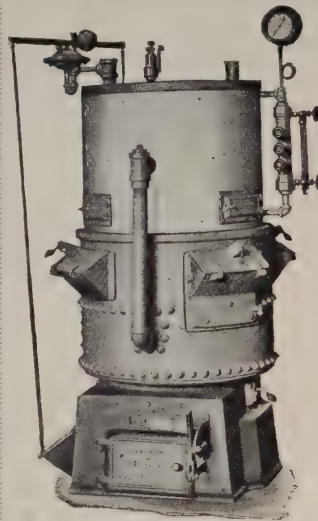
Both pumps have a capacity of 100 gallons per minute under a total net head of 293 ft. They are driven by two 20 hp. Westinghouse Motors.

These pumps are strongly built, give high efficiencies and require practically no attention.



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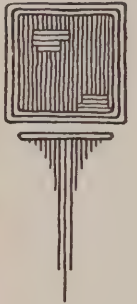
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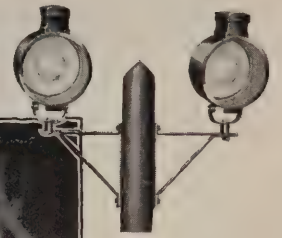
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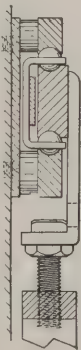
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Plate F-271-FA

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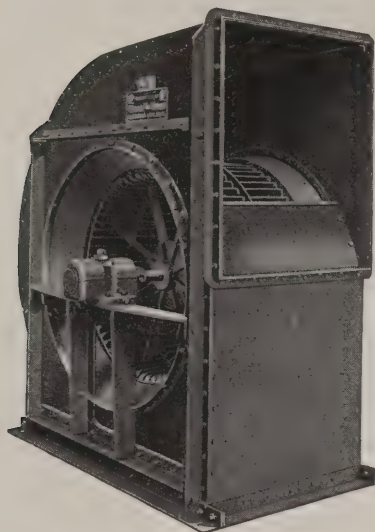
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deserves serious consideration. How serious depends upon the kind you select. The proper kind will outlast a life-time with reasonable care. The life of the other kind may be very, very limited.

### The Trenton Potteries Co. "Bathrooms of Character"

represent the best in plumbing. Glaze baked on clay gives a much harder surface than the same glaze baked on other materials. The heat applied to our ALL-CLAY products would melt other plumbing materials.

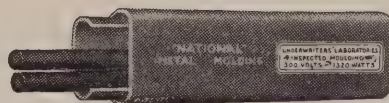
The harder you bake, the harder the object. That is why "Bathrooms of Character" fixtures are so much more **sanitary** and **so easily cleaned**. Gritty soaps cannot scratch their surface, medicine and common acid stains will not adhere. A permanent investment — a beautiful one.

By all means see that a copy of "The Blue Book of Plumbing," Catalog N, is in your files.

The Trenton Potteries Co.  
Trenton, N. J., U. S. A.

World's largest makers of All-clay Plumbing





This molding effectually eliminates every danger due to unprotected surface wiring. It is quickly and easily installed and can be painted or enameled to match walls or woodwork. Used exclusively for extension work in many of the finest buildings in this country.

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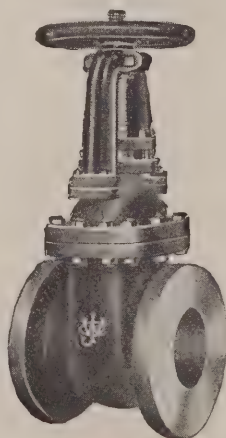
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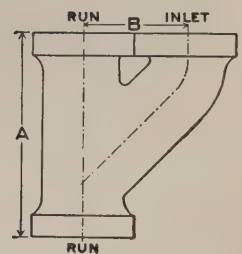
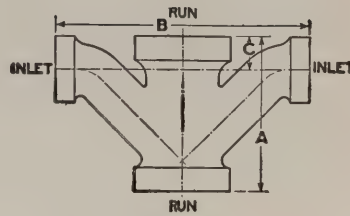
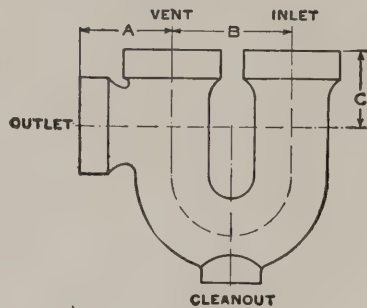
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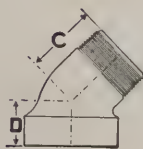
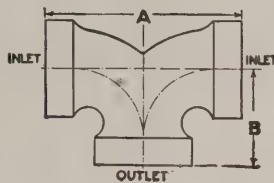
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# Drainage

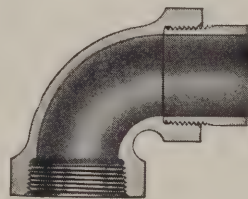


*should have an unobstructed escape from the premises.*

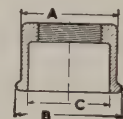
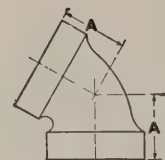
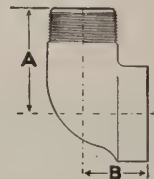
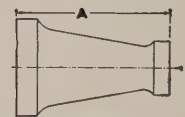
## CRANE DRAINAGE FITTINGS



are made with a shoulder against which the pipe abuts so closely that all "pockets" are eliminated, thus affording the drainage a free and continuous flow to the sewer. As a further precaution against contamination, the interior of these fittings are as smooth as it is possible to make them. They are heavy and strong enough to safely withstand the strain of settling.



We have such a large variety of patterns and sizes that we can easily accommodate the drainage system of any building, regardless of size.



*Malleable Iron Drainage Fittings made to order.*

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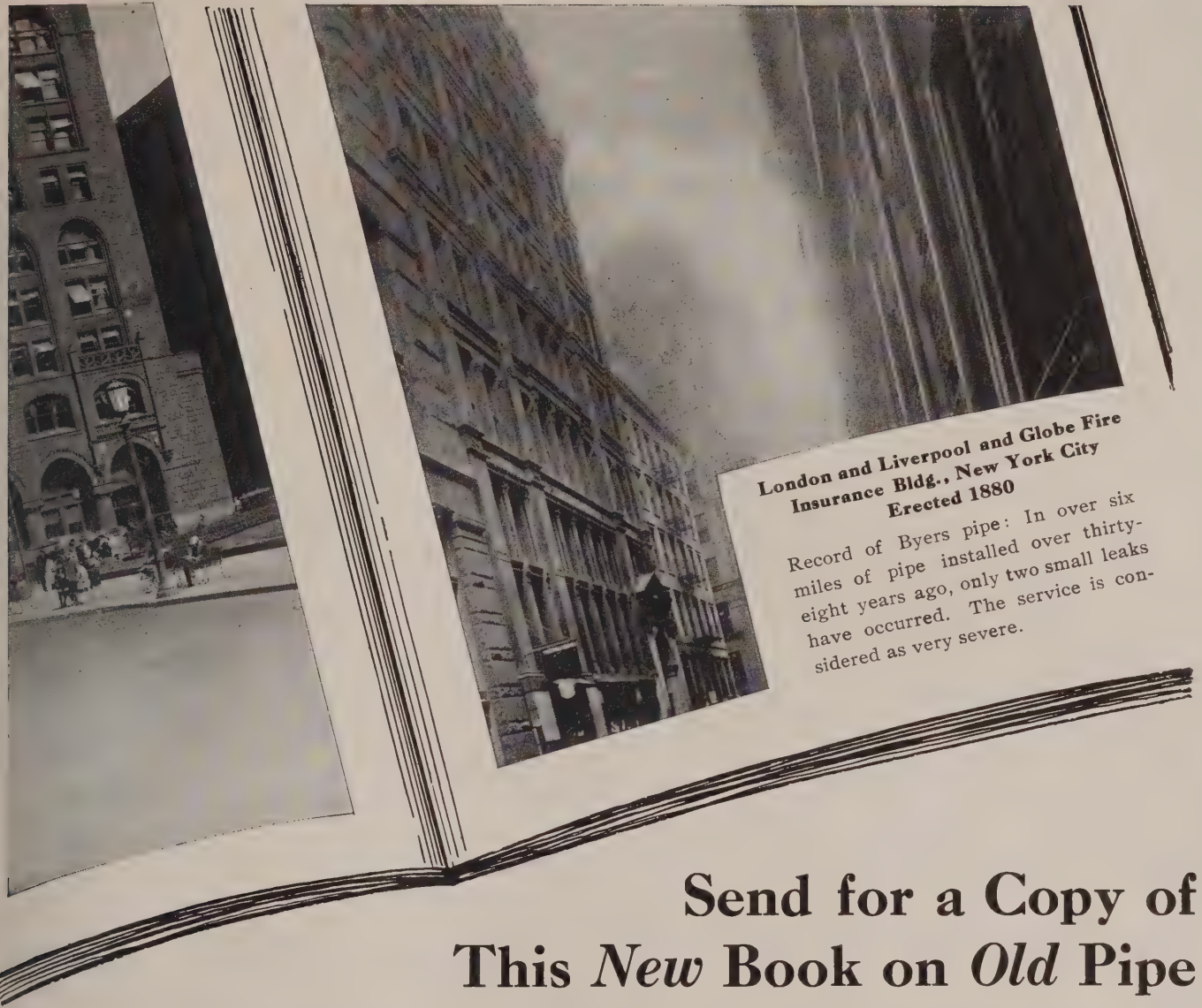
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It tells an illuminating story of pipe service in dozens of old buildings, giving an opportunity for instructive comparisons of the relative life of various kinds of pipe in similar service.

These are records of more than ordinary value, collected by personal investigations on the ground, and their lesson can be ignored by builders only at a heavy future penalty in pipe replacements, impaired values and inconvenience to occupants.

The buildings include such famous structures as the Masonic Temple, Chicago; Cooper Union, New York; National Military Home, Dayton, Ohio; Cleveland Arcade; Iroquois Hotel, Buffalo; St. Louis Post Office and dozens of others, all illustrated.

*Send for copy of this book, "ON THE TRAIL OF BYERS PIPE"*

**A.M. BYERS COMPANY, PITTSBURGH, PA.**

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Salem Brass & Iron Mfg. Co.,  
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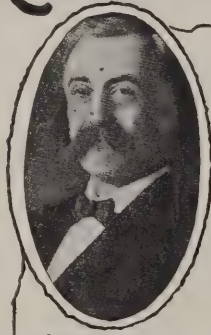
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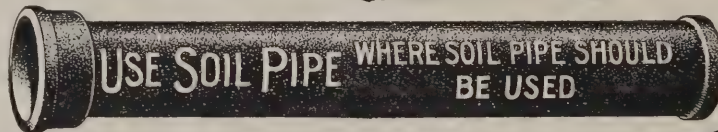
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Master Plumbers  
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— the evidence strongly supports those contending that **CAST IRON SOIL PIPE**, for its lasting qualities, is the superior.

"All things considered **CAST IRON SOIL PIPE** is the more reliable as a conveyor of discharges" —



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### Use **CAST IRON SOIL PIPE** for SOIL LINES VENT LINES LEADER LINES WASTE LINES

No corrosion — No menace of leaking sewage and sewer gases — No tearing out of floors and walls after pipe is installed

### Use **CAST IRON SOIL PIPE** for HOUSE DRAINS HOUSE SEWERS

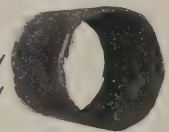
No pollution under cellars — No stoppage by tree roots — No danger of breakage by jar or settlement — No costly replacements

**CAST IRON SOIL PIPE LASTS  
LONGER THAN THE BUILDING**

Vitrified house sewers choked by tree roots, replaced with Cast Iron Soil Pipe



Wrought iron 4" nipple, rusted out in a few years, causing bad leak over room in hotel



Wrought iron pipe disintegrated by rust action, causing escape of sewer gas





Architect—Edward Stotz, Pittsburgh, Pa.  
Contractors—Thompson-Starrett Company  
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Another "NATIONAL"ized Building

# "NATIONAL" Pipe in Large Buildings



## Schenley High School Pittsburgh, Pa.



¶ This magnificent building is a typical example of modern civic progress; to appreciate more fully the advancement made in the last century in civic accomplishment, compare THE SCHENLEY HIGH SCHOOL with the "little red school house" of fifty years ago.

¶ Those interested in the progress of education in all its phases have flocked, from every section of the country, to see this wonderful new building (An education in itself!) in order to learn at first hand the lessons to be applied to their own schools and their buildings, either those already existing or in prospect.

¶ The knowledge and skill possessed by those responsible for the design and construction of this noble development of civic pride are displayed in the completeness of every detail; all material was carefully selected, to the end that nothing inferior might detract—either in appearance or ultimate service—from the architect's high ideals. Therefore

### "NATIONAL" Pipe Was Specified

Complete information about "NATIONAL" Pipe may be found on pages 1339-1351, inclusive, of the 1917 edition of Sweet's Catalogue.

This is the eighth of a series of "NATIONAL"ized buildings as follows:

#### THE UNION ARCADE, Pittsburgh, Pa.

American Architect, Feb. 21st, pages 60-61.  
Architectural Forum, March, pages 41-42.  
Buildings & Building Management, May, pages 23-24.

#### THE EQUITABLE BUILDING, New York, N. Y.

American Architect, March 21st, pages 19-20.  
Architectural Forum, April 1st, pages 35-36.

#### CONTINENTAL & COMMERCIAL NATIONAL BANK BUILDING, Chicago, Ill.

American Architect, May 2nd, pages 21-22.  
Architectural Forum, May, pages 45-46.  
Buildings & Building Management, June, pages 23-24.

#### HOTEL TRAYMORE, Atlantic City, N. J.

Architectural Forum, June, pages 39-40.  
Buildings & Building Management, July, pages 23-24.

#### JOHN WANAMAKER COMPANY BUILDING, Philadelphia, Pa.

Architectural Forum, July, pages 33-34.  
Buildings & Building Management, August, pages 23-24.

#### DODGE BROTHERS FACTORY, Detroit, Mich.

Architectural Forum, August, pages 37-38.  
Buildings & Building Management, September, pages 23-24.

#### MORMON TEMPLE, Salt Lake City, Utah.

Architectural Forum, September, pages 71-72.  
Buildings & Building Management, October, pages 23-24.

¶ To readily identify "NATIONAL" material and as protection to manufacturer and consumer alike the practice of National Tube Company is to roll in raised letters of good size on each few feet of every length of seamless welded pipe the name "NATIONAL," (except on the smaller butt-weld sizes, on which this is not mechanically feasible on these smaller butt-weld sizes the name "NATIONAL" appears on the metal tag attached to each bundle of pipe).

¶ When writing specifications or ordering tubular goods, always specify "NATIONAL" pipe, and identify as indicated.

**LOOK FOR THE MARK**

**NATIONAL**

Name Rolled in Raised Letters on National Tube Company Pipe

¶ In addition, all sizes of "NATIONAL" welded pipe four in. and under are subjected to a roll-knobbing process known as Spellerizing to lessen the tendency to corrosion, especially in the form of pitting. This Spellerizing process is peculiar to "NATIONAL" pipe, to which process National Tube Company has exclusive rights.

¶ "NATIONAL" pipe was awarded the GRAND PRIZE (highest possible award) at Panama Pacific International Exposition, 1915.

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(See preceding page for illustration)





Nonpareil Cork Tiling in the working space of the National Union Bank, Boston, Mass. Hutchins & French, Architects

## Putting Individuality Into Bank Floors

THE floor of a banking room, no less than the wall decorations and fenestration, should reflect faithfully the characteristics of the institution. This question of uniting dignity, stability and beauty with the required durability is not an easy one, if ordinary flooring materials are used. Many discriminating architects, however, have solved the problem successfully by specifying

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By so doing they have obtained not only that which they sought, but also a resilience and silence under foot, which add immeasurably to the comfort of the patrons and the efficiency of the employees.

Nonpareil Cork Tiling is made of clean cork

shavings, compressed and baked without any foreign binder. It comes in three beautiful shades of brown, in squares and oblongs of various sizes that can be laid over any smooth, dry base. A more satisfactory material for bank working spaces, offices and vaults cannot be found.

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— made of wood or steel, embodies the progressive ideas typified by the modern office building. Being sectional and compactly designed, they utilize to the utmost the room allotted them, giving vast accommodation in small space. Beautiful in outline, handsome in wood and finish, and made of the best grade materials, Globe-Wernicke Sectional Filing Cabinets are eminently the equipment for the modern office where handsome appearance,

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Every architect should have a copy of the Globe-Wernicke Catalogue of Filing Cabinets and Safes, No. 818-A.F., and the Catalogue of Sectional Bookcases, No. 115-A.F. Write for them to-day.

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CONSTRUCTED along modern lines with the view of meeting every requirement for the satisfactory division of space, they owe their great success to dignity of appearance, ease of operation, adaptability to all conditions, strength and simplicity of construction.

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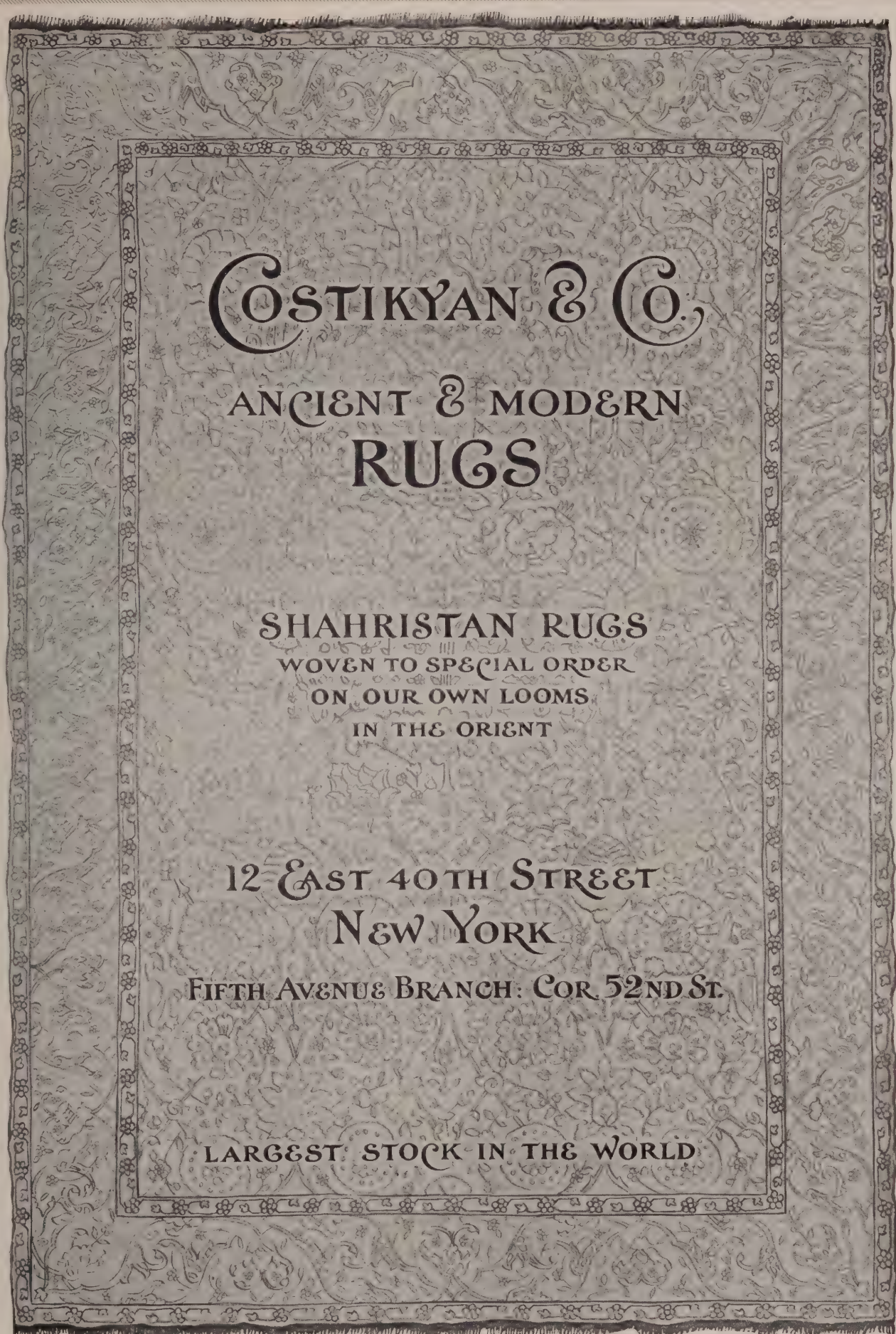
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NEW YORK CITY, N. Y.





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Perhaps one of the most striking incidents that ever occurred in connection with acoustics was when the leader of an orchestra performing in a well known auditorium was beating time with the echoes rather than the direct sound of the instruments. This was peculiar, but it actually happened. It was the result of defective acoustics.

## Hydrated LIME PLASTER

### for Scratch and Brown Coat Plastering

assists in producing perfect acoustics

All of the water used in mixing Hydrated Lime Plaster is absorbed by the backing material or passes off into the atmosphere. This leaves the hardened plaster with innumerable minute air spaces.

It is now well known that a material containing many fine pores is a much better deadener of sound than a more dense material. This is one of the reasons why Hydrated Lime Plaster is being adopted as standard by a rapidly increasing number of prominent architects.

Send for a copy of our ten-page booklet entitled "Auditorium Acoustics." Contains much valuable information for any one interested in auditorium construction.

*Send for it to-day*

## HYDRATED LIME BUREAU

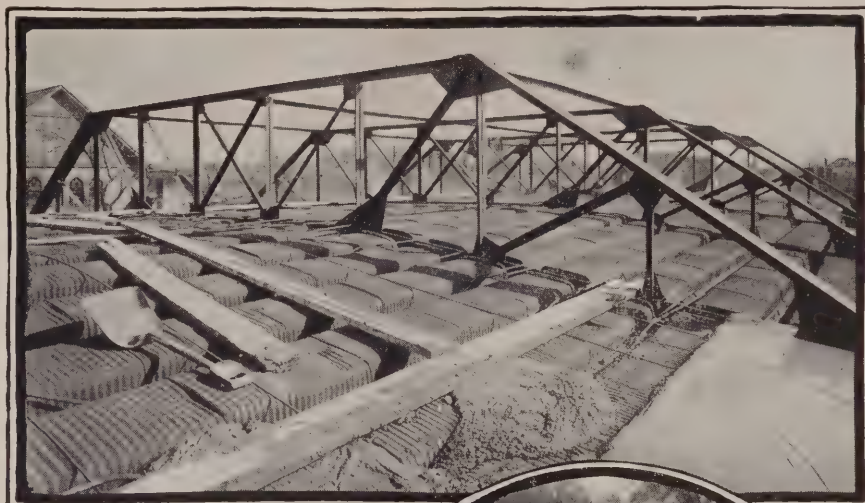
*of the National Lime Manufacturers' Association*

Arrott Bldg. - - Pittsburgh, Pa.





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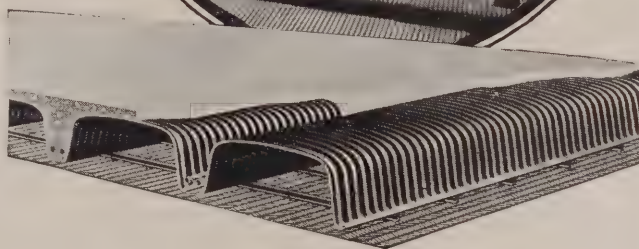
O. K. Westphal & Co., Architects  
Minneapolis  
N. F. Parson, Contractor

## GF Steel-Tile Save Many Dollars—Insure Safe, Permanent, Fireproof Floors

The two top photographs are interesting views of recent GF Steel-Tile installations. The first is a roof job on a Minneapolis theater. The second a floor in the Wallingford (Conn.) High School. In each case GF Steel-Tile was chosen because it gave the best assurance of economical, fire-safe and permanent construction.

From the standpoint of saving in materials alone, you should specify GF Steel-Tile for your concrete work.

As GF Steel-Tile are steel forms for concrete floors designed on the T-beam principle, they carry all the concrete except the narrow joists, and save a great part of the usual cost of form work and centering.



# GF Steel-Tile

Furthermore, GF Steel-Tile occupy 45 to 60% of the cubical contents of a floor. In ordinary floor construction this space would be filled with heavy concrete or tile. But GF Steel-Tile transform it into air space that weighs nothing. Such a radical reduction in weight makes possible lighter girders, lighter walls—in fact, lighter construction all the way through to the very footings of the structure.

All these savings without sacrifice of strength or safety. Every ounce of concrete in GF Steel-Tile floors is in active use. And it is so built and graded from thin slabs to deep reinforced joists that its whole strength can be exerted in

sustaining any live loads placed upon the floor. There is nothing in such construction to feed fire.

The ease and speed with which GF Steel-Tile can be laid furthers economy by cutting down the cost of labor. With the skeleton centering up, the GF Steel-Tile and reinforcing bars for the joists are set easily in place. Generally it is necessary only to nail the GF Steel-Tile lightly to the centering before pouring the concrete.

GF Steel-Tile are used in the floor construction of many modern schools, apartments, hotels, office buildings, lofts, warehouses, and stores.

*Architects and engineers will find the GF Steel-Tile Handbook a suggestive and informative work on model floor construction. Send for it, if interested*

**THE GENERAL FIREPROOFING COMPANY, Youngstown, Ohio**

Manufacturers of all types of Metal Lath, Concrete Reinforcements, and Waterproofings

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# Floretyle Economy



A stack of 50 Floretyles, handled on a two-wheeled truck, is equivalent in floor construction to 333 terra cotta tile weighing over 10,000 lbs.



No Waste of Concrete in Joist between Floretyle



Accurate Spacing of Joists and Reinforcement

An important point of economy in Floretyle Construction is the handling of 50 Floretyles on a single truck by one man. Compare this to its equivalent in floor construction in terra cotta tile. Picture for yourself 333 terra cotta tile being handled. The comparison is a surprise in economy.

Only the simplest and most inexpensive centering is required with Floretyle Construction. The saving in material and labor on this one item is immense. Floretyles take the place of heavy masses of concrete and at the same time provide a construction of great rigidity. This greatly reduces the weight of the construction and in buildings with light loads, such as hotels, offices and stores, the savings in columns, girders and foundations will often amount to 15%.

With Floretyle Construction deep joists permit the use of long spans without any intermediate beams. This span will easily cover 50 feet without beams. The beams which support the Floretyle Construction can be readily made the same depth as the floor construction. In this way an absolutely flat ceiling is secured throughout the entire building.

The saving in materials, the large units that are handled, the reduction of field labor, the simple centering and the wide spacing of joists save time in the construction of floors and greatly increase the speed of erection with Floretyle Construction. "Economy is the keynote where Floretyles are used."



## TRUSSED CONCRETE STEEL CO.

DEPT. R-57 — YOUNGSTOWN, OHIO

Representatives in Principal Cities

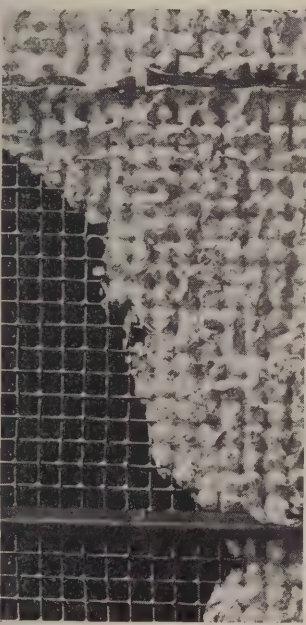


Steel Floretyle Construction, Austin High School, Austin, Texas

Dennis R. Walsh, Architect; Van Horn-Shaw Construction Co., Contractors



# THE TEST OF TIME



100,000 Sq. Yds. of  
WRIGHT WIRE LATH here

THE South Station, Boston, has been standing for nearly twenty years. During this time, every day for twenty-four hours, the walls have been subjected to an almost continuous vibration of the most severe kind—not alone from the trains within the shed, but from the elevated trains on the street side as well.

That these walls have stood this strain well is attested by the condition of the plaster to-day, proving beyond dispute that Wright Wire Lath, carrying plaster properly put on, makes walls of permanency.

We should like all architects and builders when in the South Station to examine, critically, the walls.

The little illustration at the left shows how the plaster keys on to Wright Wire Lath. This shows the back side and fully illustrates the fact that the plaster completely embeds the lath, making a solid, stone-like wall with an iron core. There is no exposed metal to be acted upon by the elements, causing rust and a final disintegration of the wall itself.

Wright Wire Lath is a woven fabric of cold-drawn steel wires of great strength, rigidity and durability. It is fire proof. Owing to its strong and even selvage it is easily handled and tied together. It can be used wherever plaster is used.

Wright Wire Lath is supplied in rolls 50 yards long and 1 yard wide; three finishes, — plain, japanned and galvanized.

*Send for Booklet L, Architect's Service Sheet, and ask us any questions that might come into your mind on the subject*

Wright Wire Co.,

Worcester, Mass.



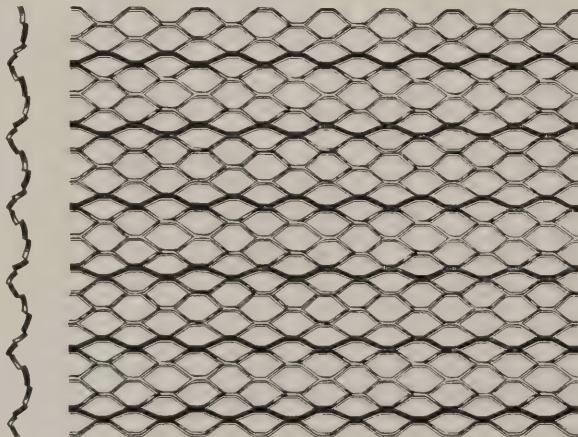
# You Know Many Residences Worth Improving



There are many houses in every location that can be improved by remodeling like the one in this illustration.

Good substantial frame residences built 10 or 15 years ago, unattractive now, may be given the appearance of new stucco homes.

The best way to improve the exterior of an old frame house is to overcoat it with stucco on



## ***Kno-Burn***

### **Corrugated Metal Lath**

It goes right on the weather boards and is self-furring, avoiding the extra labor of putting on furring strips. Ask for information on overcoating.

### **North Western Expanded Metal Co.**

Member Associated Metal Lath Manufacturers

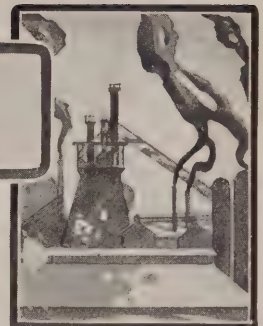
934 Old Colony Building

Chicago, Illinois





# In the Buckeye State



OHIO is one of the richest and most progressive states in the Union. Its wheels of manufacture keep revolving incessantly to supply the nation's need for its many diversified products.

New manufactories are being established and old ones are growing. Likewise, Ohio's population is rapidly increasing, which, in turn, means the necessity of considerable additional building.

**Berger's**

*Metal Lumber*

(Patented)



Thomas Apartments, Lima, O.  
Architects, McLaughlin & Hulsken



Massillon City Hall, Massillon, O.  
Architect, J. M. Bostick



Gordon Apartments (Madison Square), Cleveland, O.  
Architect, E. Janowitz



Mercy Hospital, Canton, O.  
Architect, W. P. Ginther



Oak Harbor School, Oak Park, O.  
Architects, Bacon & Huber



Girls' Dormitory, Ohio Masonic Home, Springfield, O.  
Architect, R. C. Gotwald



Y. M. C. A. Building, Akron, O.  
Architects, Harpster & Bliss



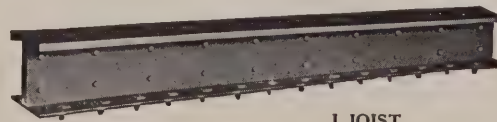
The Chemical Ring Co., Toledo, O.  
Architects, John Neatz & Bro.

is playing an important part in the erection of these buildings, as it has in the past. Hundreds of buildings thruout the state now stand as monuments for the efficiency of this pressed steel construction.

Its use means more substantial structures, which will not weaken under the burden of attacks by time, fire, moisture and rodents — structures which exemplify the modern trend in building for permanency and eliminating the periodical upkeep expenses always necessary where lower first cost materials are used in construction.

Architects will find Berger's Metal Lumber an ideal material for use in the floors, walls, roofs and partitions of any size or type of building.

Our Engineering Department is at your service in making suggestions, estimates and layouts of Metal Lumber construction.



1 JOIST

See Sweet's, pages 244-250  
and send for Technical Bulletin 12 F

**The Berger Mfg. Company**  
CANTON, OHIO



Branches: Boston New York Philadelphia Chicago  
St. Louis Minneapolis San Francisco Los Angeles  
Export Dept.: Berger Bldg., New York City, U. S. A.



*Used for Years*

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TRADE MARK

## For All Concrete Floors

To permanently harden and dust-proof your clients' floors specify Lapidolith.

The firms below have already acted on this advice. Their floors and many others are now dust-proof and wearproof for all time:

American Woolen Company  
American Print Works  
American Writing Paper Co.  
Armstrong Cork Company  
British-American Tobacco Co.  
Beechnut Packing Company  
Crane Company  
Ford Motor Company  
General Electric Company  
B. F. Goodrich Company  
International Harvester Company  
Johns Hopkins University Bldgs.  
Procter & Gamble Company  
Swift & Company  
United States Steel Corporation  
U. S. Navy Dept.

Lapidolith should be flushed on all concrete floors new or old.

For scientific proof, specification form and sample flask write to

Department 4

### L. SONNEBORN SONS, INC.

*Manufacturers of Cemcoat  
the Washable Wall Coating*

264 Pearl Street

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*Used for Years*



## EVANS

### "ALMETL" FIRE DOORS

(Pat. Pending)

prevent the spread of flames through fire wall openings as surely as a curtain of water.

Their all-steel and asbestos construction, lightness of weight and low maintenance cost make them the first choice of both architect and client.

Approved by  
Underwriters Laboratories, Chicago  
Factory Mutual Laboratories, Boston, and  
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Manufacturers of  
FIRE RETARDING "STAR" VENTILATORS  
"MERCHANT'S OLD METHOD" ROOFING TIN

## MERCHANT & EVANS Co

NEW YORK PHILADELPHIA WHEELING  
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*New Buildings for Egyptian Lacquer Co., Newark, N. J.  
Turner Construction Co., Builders*

## FOR PERMANENT CONCRETE

**ANTI-HYDRO**  
FOR PERMANENT CONCRETE  
HARDENS WATERPROOF

was used for waterproofing and hardening the concrete floors, pits, walls and tunnel of the Egyptian Lacquer Company buildings. Where unusually difficult conditions are to be met, "ANTI-HYDRO" is generally chosen. Aside from hardening and waterproofing concrete absolutely, "ANTI-HYDRO" makes concrete acid, alkali and oil resisting all in one operation.

Send for specification and detailed information.

IT COSTS LESS TO PUT IT IN  
THAN TO LEAVE IT OUT

### Anti-Hydro Waterproofing Co.

Singer Bldg., New York Laboratory, Newark, N. J.  
And Principal Cities





*Longer Life*—durability and rust resistance—is assured from Keystone Copper Steel products.

When this alloy steel is used for Galvanized Sheets, Black Sheets or Roofing Tin, the *Keystone* is added below regular brands. Shall we send booklets showing weather tests?

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General Offices: Frick Building, Pittsburgh, Pa.

### DISTRICT SALES OFFICES

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Export Representatives: UNITED STATES STEEL PRODUCTS COMPANY, New York City

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## GENERAL SLATE COMPANY

Fine Unfading Maine and Vermont Slates

200 Devonshire Street, Boston

Washington's headquarters in 1776. Home of the Vassall and Craigie families, and of the poet Longfellow



Roofed with Welsh slates early in the 19th century. Roof sound and good and no repairs for last 50 years

CRAIGIE HOUSE, CAMBRIDGE, MASS.





BUILDING OF E. GREENFIELD'S SONS, BROOKLYN, N. Y.  
TURNER CONSTRUCTION COMPANY, CONTRACTORS AND ENGINEERS

LEHIGH CEMENT USED

# LEHIGH CEMENT

No building material is represented in so many types of construction as concrete. Farm or factory; residence or office building; a viaduct or a flower box: such is the range of this well-nigh national material.

LEHIGH PORTLAND CEMENT COMPANY

*Member of the Portland Cement Association*

CHICAGO, ILL.

ALLENTOWN, PA.

SPOKANE, WN.



## for industrial buildings

Reinforced concrete is *the* construction, particularly now, speed being important and materials for structural steel buildings hard to get.

Concrete is quick construction — materials readily secured. Low maintenance and low insurance rates make it economical. It is also fireproof, sanitary, rigid and durable — supremely efficient.

Its utilitarian values long overshadowed its architectural possibilities; but now its adaptability to simple, dignified, beautiful design is recognized by owners who demand good looking as well as efficient buildings.

### Atlas service to architects

Our Technical Department will gladly furnish data and statistics and will co-operate upon request in developing designs and economical layouts. Architects who are interested in the promising field offered by concrete construction are invited to write for our free book and to avail themselves of the service of our Technical Department.

### The Atlas Portland Cement Company

*Member of the Portland Cement Association*

New York Chicago Phila. Boston St. Louis Minneapolis Des Moines Dayton Savannah

*American Can Co.  
Maywood, Ill.  
N. M. Loney  
Architect*



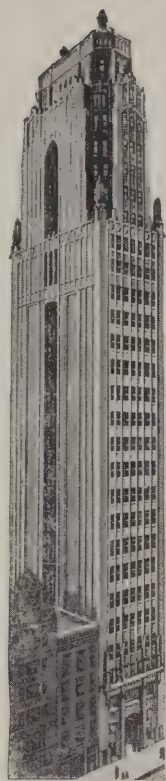
# ATLAS CEMENT

THE ATLAS PORTLAND CEMENT COMPANY, 30 Broad St., N. Y., or Corn Exchange Bank Bldg., Chicago. Send book on Industrial Buildings and information about Atlas Service to name and address written on margin, particularly subjects checked.

..Warehouses ...Factories ...Lofts ...Cold Storage ...Terminals ...Hospitals ...Schools ...Business Garages ...Stables.

If you will state kind of business for which building is intended, \_\_\_\_\_ special information will be furnished.



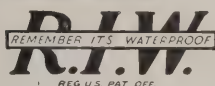


Bush Building, New York  
Helmie & Corbett, Architects  
Steel work preserved with  
No. 112 "R. I. W."

## Impossible Without Steel

The Bush Building, like New York's other great office structures, would be an impossibility without a backbone of steel.

Steel, in its turn, would not be dependable without a safeguard against rust.



**PROTECTIVE  
PRODUCTS**

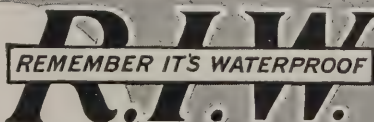
The steel in the Bush Building is protected against rust, alkalies and electrolysis by No. 112 "R. I. W." The alkalies in cement mortar and concrete can't injure it.

It is the Toch Standard finishing coat for imbedded steel work—preferably used over a priming coat of "R. I. W." Tockolith. (Patented.)

Our Blue Book on Steel Preservative Paints is complete and authoritative. Write for a copy. Please address Dept. 97.

### TOCH BROTHERS

Technical and Scientific Paint Makers Since 1848  
320 Fifth Avenue, New York City  
Works: New York; London, Eng.; Toronto, Canada



**STEEL NEED NOT RUST!  
WOOD NEED NOT ROT!  
NOR CONCRETE DUST!**

REG. U.S. PAT. OFF.



## Non-Staining Stucco

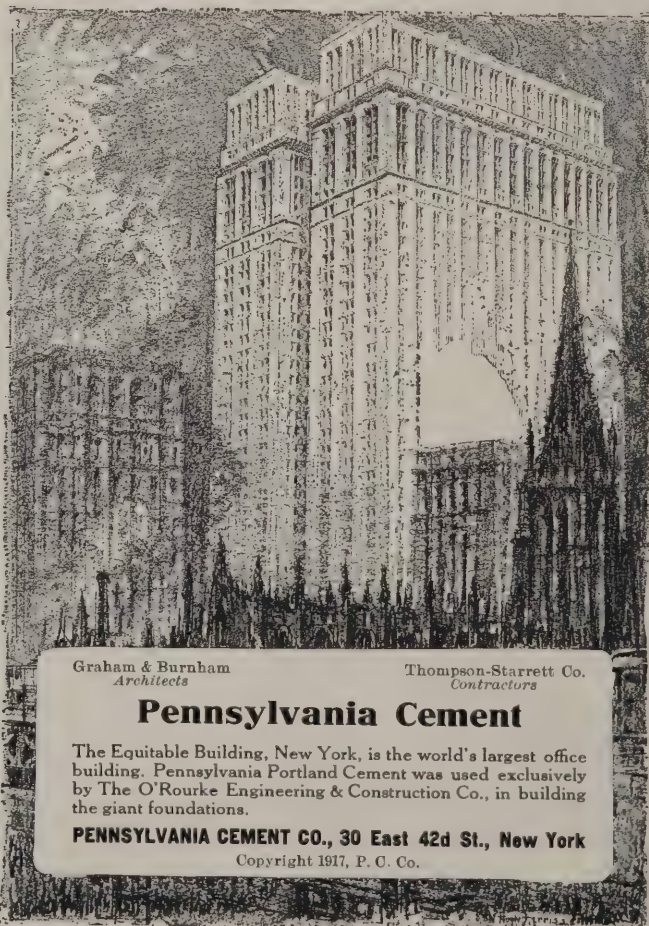
Both the appearance and the durability of cement stucco are improved by the use of

**MEDUSA WATERPROOFING**  
PATENTED PASTE AND POWDER

It prevents hair-cracking while the stucco is setting and it makes it permanently non-absorbent and non-staining. Medusa Waterproofing is specified by most architects who have been responsible for noteworthy stucco architecture.

Write for Booklets

The Sandusky Cement Co., Dept. S, Cleveland



Graham & Burnham  
Architects

Thompson-Starrett Co.  
Contractors

### Pennsylvania Cement

The Equitable Building, New York, is the world's largest office building. Pennsylvania Portland Cement was used exclusively by The O'Rourke Engineering & Construction Co., in building the giant foundations.

PENNSYLVANIA CEMENT CO., 30 East 42d St., New York

Copyright 1917, P. C. Co.





# *Now is the Time to Use* **CONCRETE**

War Bulletin No. 2, of the Chamber of Commerce of the United States, says:

"Iron and steel should be used only when the requirement is unavoidable. Every effort should be made to use wood and concrete in place of steel whenever this can be done, and construction and development work requiring steel should be postponed wherever possible . . . cement may be had in quantity for concrete work."

Says Cass Gilbert, the New York architect:

"There are hundreds of buildings erected in this country every year which could be just as well erected without steel, and in hundreds of others the amount of steel could be greatly reduced. An enormous tonnage could be saved if reinforced concrete, masonry or other material were used. Practically all buildings of moderate height can be erected without the use of large quantities of structural steel. Reinforced concrete or old-fashioned masonry can take its place."

Under present conditions concrete is particularly desirable. All the materials—portland cement, sand, pebbles or crushed stones—are staple products, most of them obtainable near by. Concrete is made with ordinary labor under skilled supervision. Concrete contractors have developed rapid and efficient methods of construction. There are many engineers, architects and contractors who specialize in concrete construction. If necessary we can help you get in touch with them.

## CONSIDER THE ADVANTAGES OF CONCRETE

|                   |                     |                               |
|-------------------|---------------------|-------------------------------|
| <i>Fireproof</i>  | <i>Verminproof</i>  | <i>Rigid</i>                  |
| <i>Watertight</i> | <i>Sanitary</i>     | <i>Rapidly built</i>          |
| <i>Durable</i>    | <i>Weatherproof</i> | <i>No Repairs—No Painting</i> |

Concrete is used today more generally than ever before. The smallest job on the farm and the largest engineering works are built of concrete. Use concrete to build that factory, foundry, shop, warehouse, bridge, tank or reservoir for storing liquids, coal pocket, ore bin, grain elevator, garage—any building you are planning.

*Let us send you an interesting pamphlet entitled, "Why Build Fireproof?"*

## PORTLAND CEMENT ASSOCIATION

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## **CONCRETE FOR PERMANENCE**

# Protected From Water Damage

The foundations of the new Vinton Bldg. are water and moisture proof. The permanence of the structure and the safety of its contents are thus completely insured. This result was obtained by waterproofing all concrete with

## TRUS-CON *Waterproofing Paste* CONCENTRATED

THE VINTON BUILDING, DETROIT  
Albert Kahn, Architect  
Ernest Wilby, Associate

This product is the only *concentrated* waterproofing material on the market and therefore both the most certain and economical. This is attested by a record of thousands of successful results and not a single failure.

*Structural Waterproofing, a handsomely bound volume, 8½" x 11", giving full information upon Trus-Con Waterproofing Paste will be sent free on request written on business stationery.*

### The Trus-Con Laboratories

Manufacturers and Inventors of

*Waterproofings, Dampproofings, Technical Coatings and Floor Hardeners*

1246 Trus-Con Building

Detroit, Michigan







## Stucco of new color and texture

The new aggregate-toned stucco gives the architect a fresh medium to work with—or at least a medium with fresh possibilities. This stucco obtains its effects by adding screenings of richly colored granite or marble, or warm-toned sands or gravels to Atlas-White Cement in the finish coat. It is therefore necessarily capable of highly individual treatment with a great variation of color, tone, and texture. The color is permanent and shown in its fullest value by the white non-staining cement.

Our monograph for architects, "Color Tones in Stucco," describes our experiments in aggregate toning; reproduces in full scale and color sample panels of the results, each with its formula; lists some sources of available aggregates; and contains a convenient guide to color stucco specifications. A copy will be mailed to you on request. The Atlas Portland Cement Company, New York or Chicago.



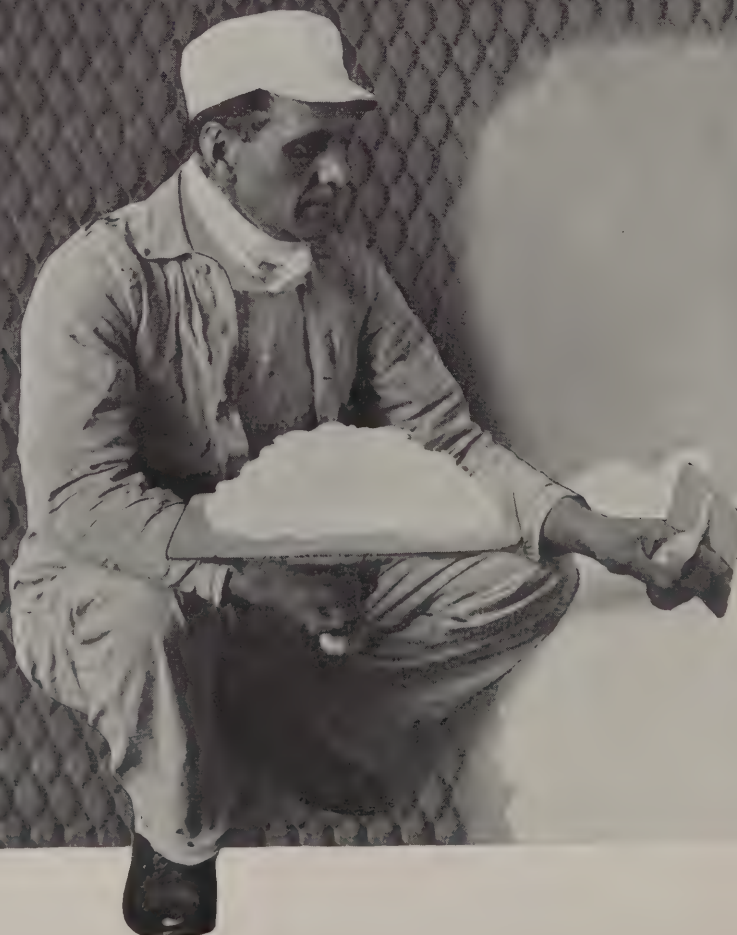
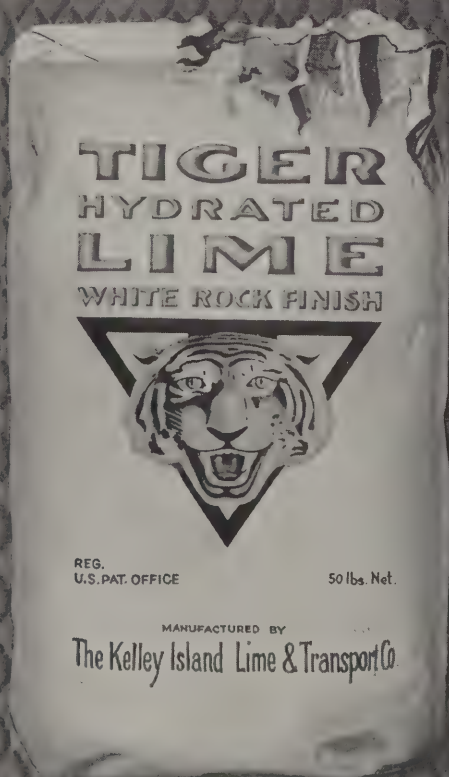
# TIGER LIME

## IS EASILY PREPARED

**T**IGER Lime is already slaked and screened, and requires only soaking over night to prepare it for use.

**The Kelley Island Lime  
& Transport Co.**

CLEVELAND, OHIO







# INDUSTROLITE

## THE FACTORY FIXTURE

IT seems so simple now that it has been done—yet for years factory people have been hoping that just such a practical fixture might be developed for them. The vital need in manufacturing plants is for a light without glare, but with illumination of sufficient breadth and intensity to satisfy their peculiar conditions. The Industrolite does just this.

A certain amount of direct light has always been considered desirable; this is provided by the large opening in the bottom of the reflector band.

The reflector band is so placed around the lamp that it protects the eye from the direct glare of the lamp within normal angles of vision and yet does not absorb the light within these angles, but directs it to the upper reflector for redirection to useful angles.

The upper porcelain enameled reflector directs all of the light to useful angles, none being emitted above 90 degrees.

As a result, THE INDUSTROLITE, by protecting the eyes yet giving amply sufficient illumination, rightly placed

### *Promotes*

1. Reduction of accidents.
2. Greater accuracy in workmanship.
3. Increased production.
4. Less eye strain.
5. Better working and living conditions.
6. Greater contentment of the workmen.
7. More order and neatness in the plant.

### *Obviates*

1. Figures on specifications mis-read.
2. Measurements mis-read.
3. Machines improperly adjusted.
4. False marks on work mistaken for center punch or other marks.
5. Sizes on drills mis-read.
6. Poor work, due to tired eyes.
7. Men careless due to headache and nervous strain.

LET US SEND YOU,  
if interested in any phase  
of industrial lighting, matter  
relative to the Industrolite.

## LUMINOUS UNIT COMPANY

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# Jefferson

THE brothers Adam would indeed be proud of the Tea Room in the new George Haas & Sons store San Francisco for no more beautiful interpretation of the beauties of the Adam style could well be conceived

No detail has been overlooked and one can imagine the joy of the architect upon finding in the Jefferson Number 1840 Adam Bowl a lighting unit which fits so perfectly into the general scheme while affording the illuminating efficiency so necessary

*May we have the pleasure of telling you about our other period designs*

**The Jefferson Glass Company**

Follansbee, West Virginia

*Pittsburgh is 40 miles away*

Sales Offices New York Chicago  
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## For COMMERCIAL LIGHTING Specify MEFCOLITE SEMI-INDIRECT UNITS

NO GLARE OR EYESTRAIN

The MEFCOLITE is a particularly practical and efficient fixture for the lighting of schoolrooms, halls, gymnasiums, basements, etc.

Also office buildings, stores, hospitals, sanitariums, etc.  
Combines these novel and essential features:

Maximum safety in support of glass bowl, which is locked in a heavy metal adjustable ring.

Supporting rods adjustable in length, permitting focusing of lamp and use of different lamps in same fixture.

Minimum maintenance cost. Bowl is cleaned by simply unhooking one support. (See cut below.)

Glassware not handled after installation.

Ceiling shadows practically eliminated.

No screws or springs in fixture.

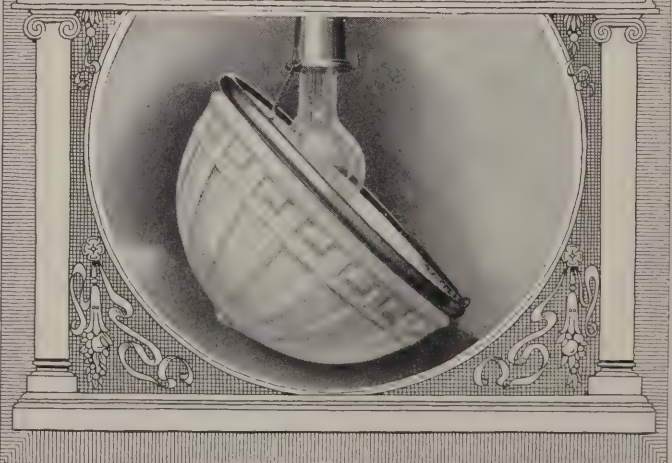
*Samples furnished for demonstration.  
Send for Booklet.*

**H. G. McFADDIN & CO.**

42 WARREN STREET

NEW YORK

We have in preparation, under the auspices of The Architectural Service Corp. of Philadelphia, a "Service Sheet" showing details of our "MEFCOLITE." Send us your name and address to receive a copy of this "Service Sheet."







## Ivanhoe Reflecto-Cap Diffusion Makes Good Lighting Out of Raw Light

After you have plenty of light in the factory the hardest problem is to escape an eye-straining glare. A bad glare partly nullifies the advantage of the increased light. Glare is blinding. It hampers the ability to see.

Glare can often be reduced below the danger point by the use of standard types of IVANHOE Steel Reflectors. To eliminate glare completely use the new IVANHOE System of Reflecto-Cap Diffusion.

This gives any intensity of light desired, perfectly diffused. A silver cap fits snugly over the lower part of the MAZDA C bulb, completely concealing the dazzling filament from every direction. The cap throws the light upward against a broad reflecting surface of white enamel, which redirects the rays softly downward upon the working-plane.

The shape of the Reflecto-Cap Diffuser is such that every ray is deflected before it reaches the eye. There are, consequently, no brilliant spots on the reflector itself. Not only is the glare from the lamp eliminated, but the glare from the reflector as well.

The light diffusion is very agreeable to the eye. Sharp reflections on nearby

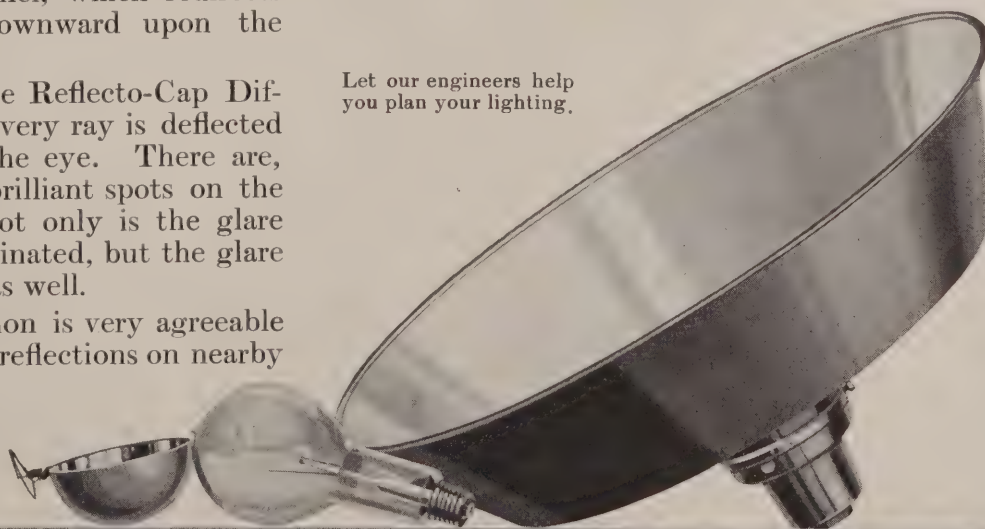
polished surfaces are avoided. Likewise heavy shadows on the work. Such shadows as remain (as underneath machines) are thin, transparent and harmless.

The operating cost is very low when compared with the illuminating result secured.

To the architect these statements will prove startling. Adequate intensities of completely glareless light at low cost are what he has been looking for and has not found. We suggest that you take steps promptly to verify our claims so that you can recommend this new system to your clients.

May we send a copy of our Engineering Bulletin on Reflecto-Cap Diffusion? Ivanhoe-Regent Works, of General Electric Co., Cleveland, Ohio.

Let our engineers help  
you plan your lighting.



# The Perfect Window

The perfect window for office and high grade loft buildings has certain definite requirements to meet. It must give a maximum amount of light from a given window opening—a maximum ventilation space when full open—and a maximum protection against outdoor conditions when closed.

The total cost of installation and upkeep over a term of years should be low in comparison to the service rendered. Its appearance should be neat and its operation should be easy.

In these points and many others there is no window on the market to compare with

# The Winslow Window

(Austral Balance)

Both sash are in the same plane when closed and slope down and out when partly open; thus effectually preventing the entrance of rain.

The counter-balance arrangement does away with sash weights, pulleys, cords and chains. The upper and lower sash balance so accurately that a slight pull on the handles serves to open or close the window.

A six-inch opening at the center may be had without breaking the connection at top or bottom, thus giving perfect ventilation without drafts.

Shades are so arranged that they give perfect shade without the use of awnings when the window is open.

Window may be washed and glass replaced from within the building, thus reducing both risk and cost of maintenance.

*Full information and printed matter upon request*

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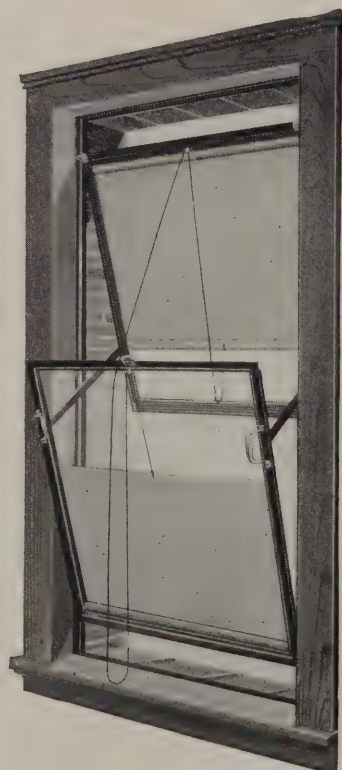
4600-4700 W. Harrison Street, CHICAGO

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### Architectural and Ornamental Metal Work

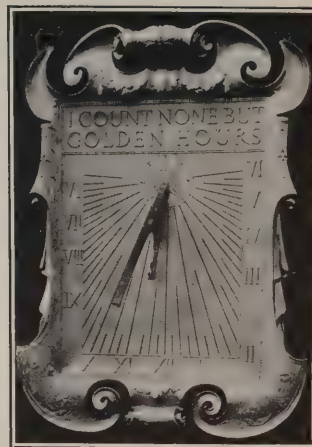
EXTERIOR LIGHTING  
FIXTURES A SPECIALTY

More than 300 models listed in our several catalogues afford a wide range for selection of design and facilitate quick delivery. We also execute with precision and despatch work from special designs.

*Write for Descriptive Literature*

WORKS: YORK, PA.

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Made by  
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(Founded in 1875)

ARCHITECTURAL BRONZE WORK  
STATUARY, MEMORIAL TABLETS  
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## BERGER'S PRESSED STEEL CORES

Make An Economical  
Floor Construction

IN long span floor construction these cores serve the double purpose of a form and a core, eliminating 40% to 60% of the concrete used in a solid floor (which is useless in resisting stresses) and reducing the dead floor load without sacrificing any strength.

The floor loads are carried to the girders by the reinforced concrete joists formed by these cores, the resulting construction being that of a series of parallel "T" beams, spaced 2 or 2½ feet apart.

The light weight of the core floors means a reduction in the size of girders, columns, footings and walls, and a saving in reinforcing bars for all parts of the structure. The simplicity of this construction assures speedy completion of the work.

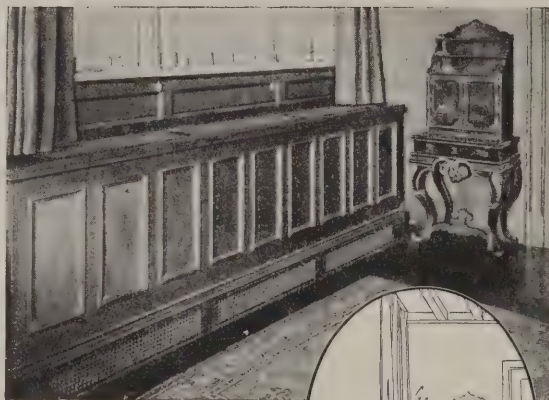
*See Sweet's, page 195, and write for particulars*

**The Berger Mfg. Co., Canton, O.**



Branches: Boston New York Philadelphia Chicago  
St. Louis Minneapolis San Francisco

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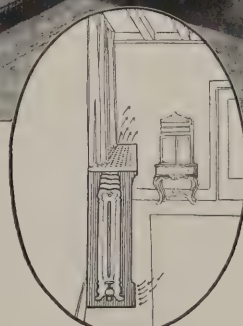
### Radiator Obscuring with

### Decorative Metal Grilles

THE panels in this one in Arthur Curtiss James' residence, New York, are hinged for accessibility.

Standard grilles we have in large assortments. Architect's designs executed with fidelity.

Allow us to co-operate with you in any of your grille enclosure problems.

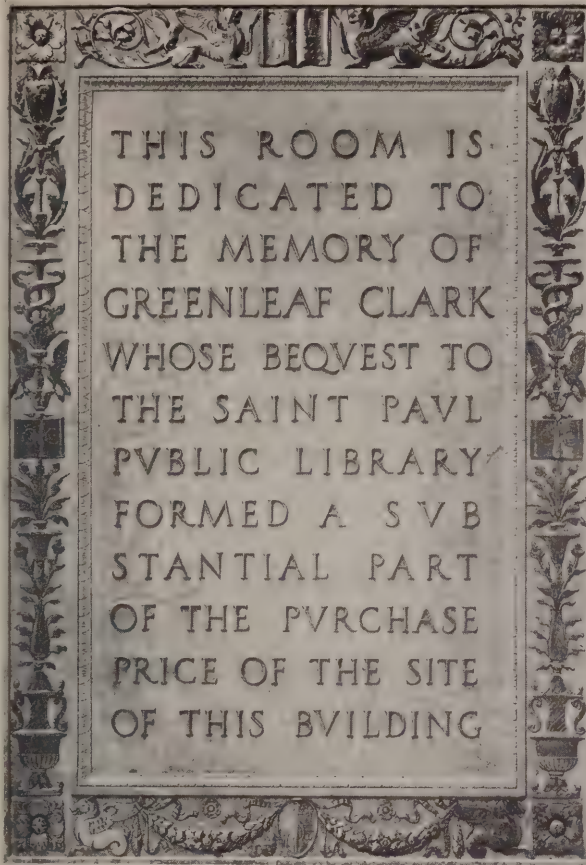


Allen & Collens, Architects

**TUTTLE & BAILEY MFG CO.**

52 VANDERBILT AVENUE  
NEW YORK





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A STRIKING RESULT OBTAINED IN A TABLET DESIGNED BY MR. ELECTUS D. LITCHFIELD, ARCHITECT FOR THE SAINT PAUL PUBLIC LIBRARY, SAINT PAUL, MINN.

THE DELICATE, GOLDEN BRONZE ORNAMENTATIONS AND LETTERING CONTRAST WELL WITH THE SUBDUED TONE OF THE MARBLE BACKGROUND, AND PRODUCE AN ARTISTIC AND PLEASING EFFECT.

OUR TABLET DEPARTMENT IS PREPARED TO FURNISH YOU WITH SUCH WORK, AND WILL GLADLY SUBMIT DESIGNS, SUGGESTIONS AND ESTIMATES ON BRONZE MEMORIAL TABLETS, SIGNS AND LETTERING.

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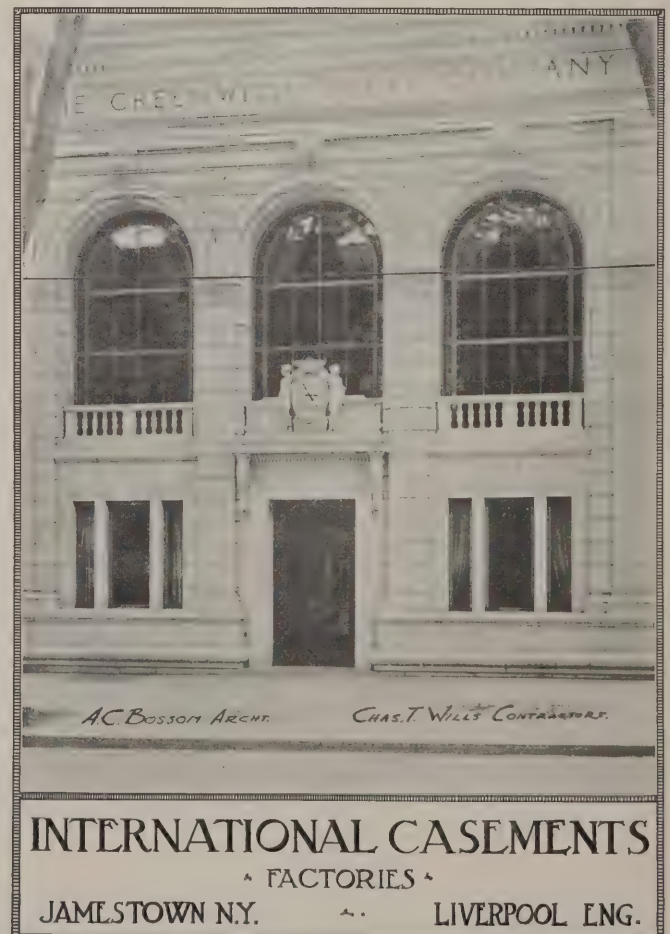
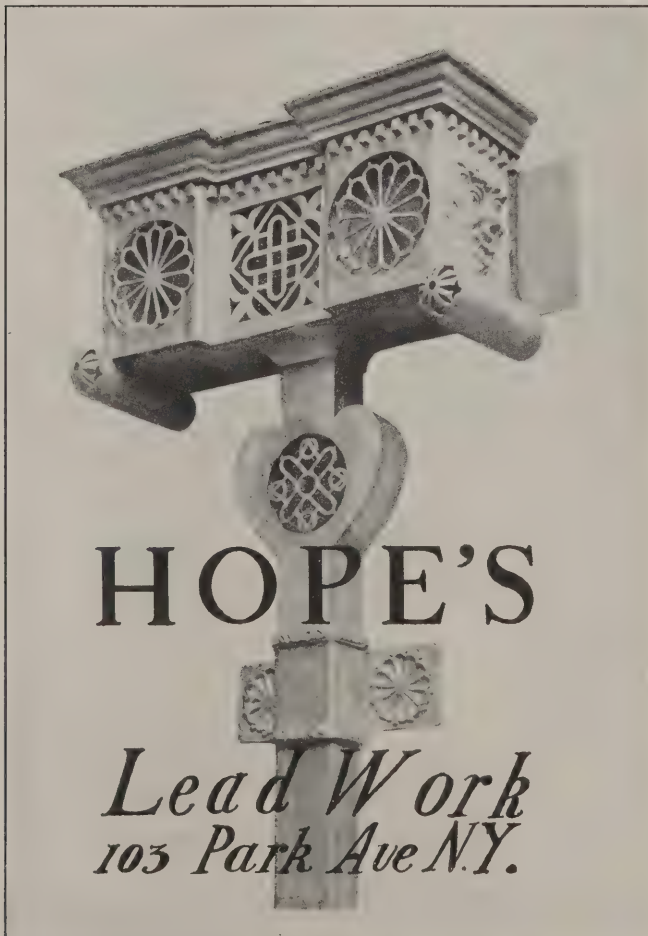
BRONZE AND IRON

118 NORTH 11TH STREET  
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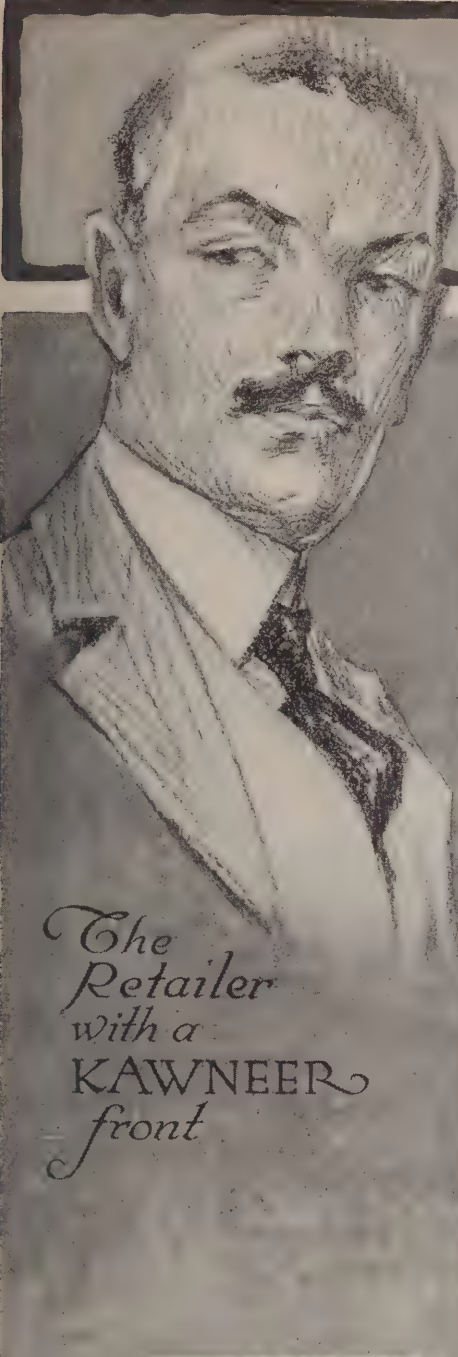


CRITTALL CASEMENT WINDOW CO., DETROIT

Manufacturers of Steel Windows and Casements







# IDENTIFICATION

**T**HE MERCHANT, conducting his business behind a **Kawneer Store Front**, *identifies* himself as a progressive and successful merchant, thoroughly familiar with up-to-date business methods.

The best recommendation he can offer the big, buying public is his ideal store front, especially designed to emphasize the beautiful merchandise which he handles.

He appreciates the architect's specification of this store front as he knows *it is right*.

**Kawneer Manufacturing Company**

Niles, Michigan

*The  
Retailer  
with a  
KAWNEER  
front*



**Kawneer**  
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Desco is the result of 28 years' experience. We have traveled up through the various stages of store front development and by that experience believe we understand your requirements. "Desco" construction combines the old-time simplicity with the modern strength, permanency and efficiency—and it costs less than you have been accustomed to pay for modern construction. This sash illustration shows its general principle. Send for Architect's details and prices—they make it easy to order.

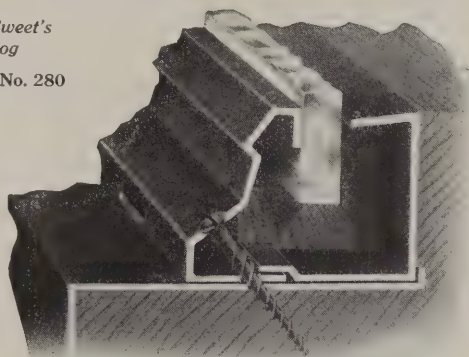
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Sash No. 280



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system has an *added asset*—the easy replacement of broken glass—which, in addition to its many other advantages, makes it the ideal system for permanently satisfactory results. Our attractive catalog completely covers every phase of Raydiant Construction, embodying information of real value to you. Want a copy?

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Berger's "Raydiant" Sidewalk Lights at Eighth and Wyandotte Streets, Kansas City, Mo.

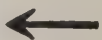
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**The lead**, in the softer grades, is responsive and even in tone. It will not crumble. In the harder grades it holds a fine point and requires less frequent sharpening. Free from grit, it will not scratch the paper.



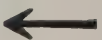
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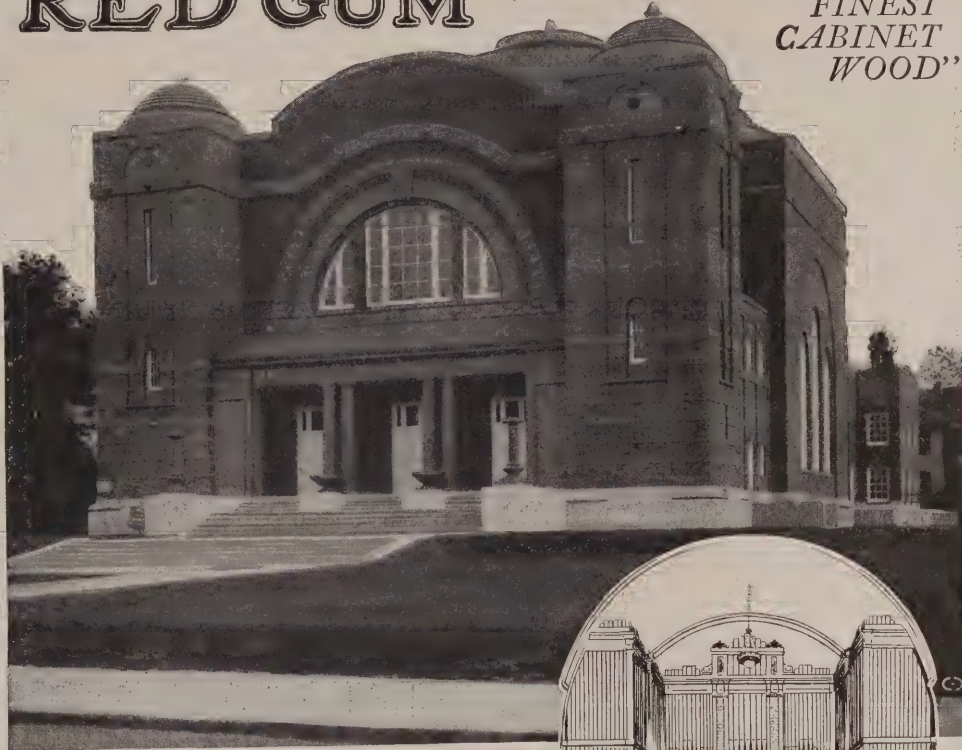
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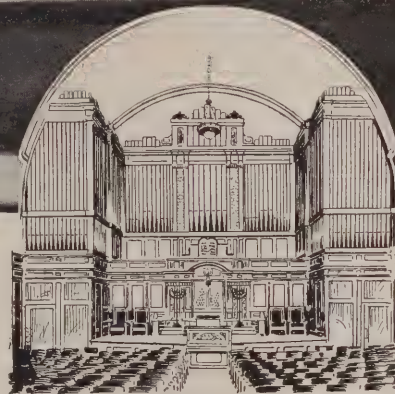
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CABINET  
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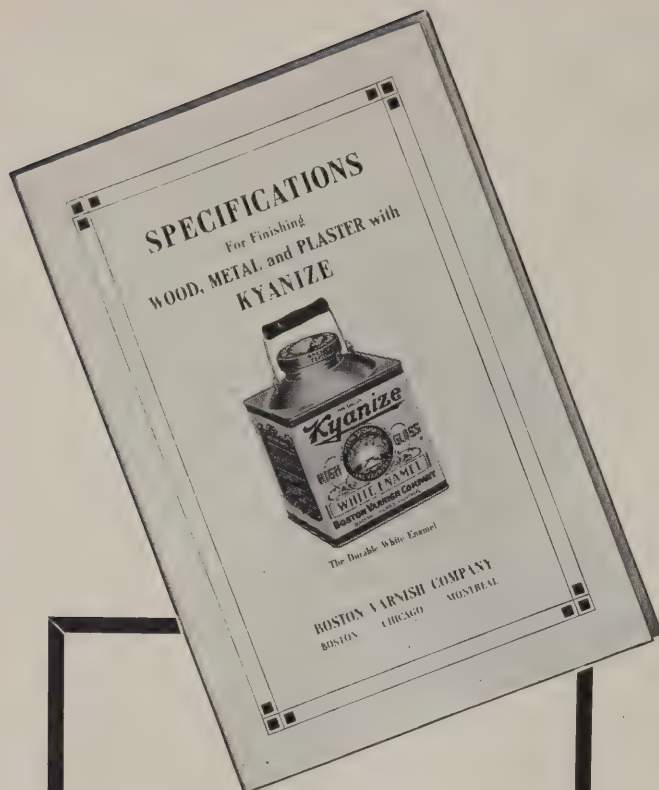
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*Matinecock Neighborhood House. Guy Lowell, Architect, N. Y. Walls finished with Old Virginia White. Roof's stained with Cabot's Creosote Stain*

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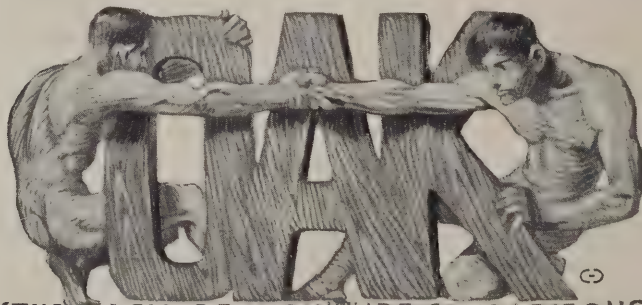
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*"the varnish that lasts longest"*

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DOORWAY  
THE STEARNS HOUSE  
at Bedford, Mass.  
Built in 1802.  
Reuben Duren, Architect.

The front elevation of this house was shown in Vol. 1, No. 2 of the White Pine Monographs.

**T**HREE essentials for success in home-building are—a practical plan, artistic design and good workmanship.

But without the fourth essential—proper selection of materials—the other three are of little avail.

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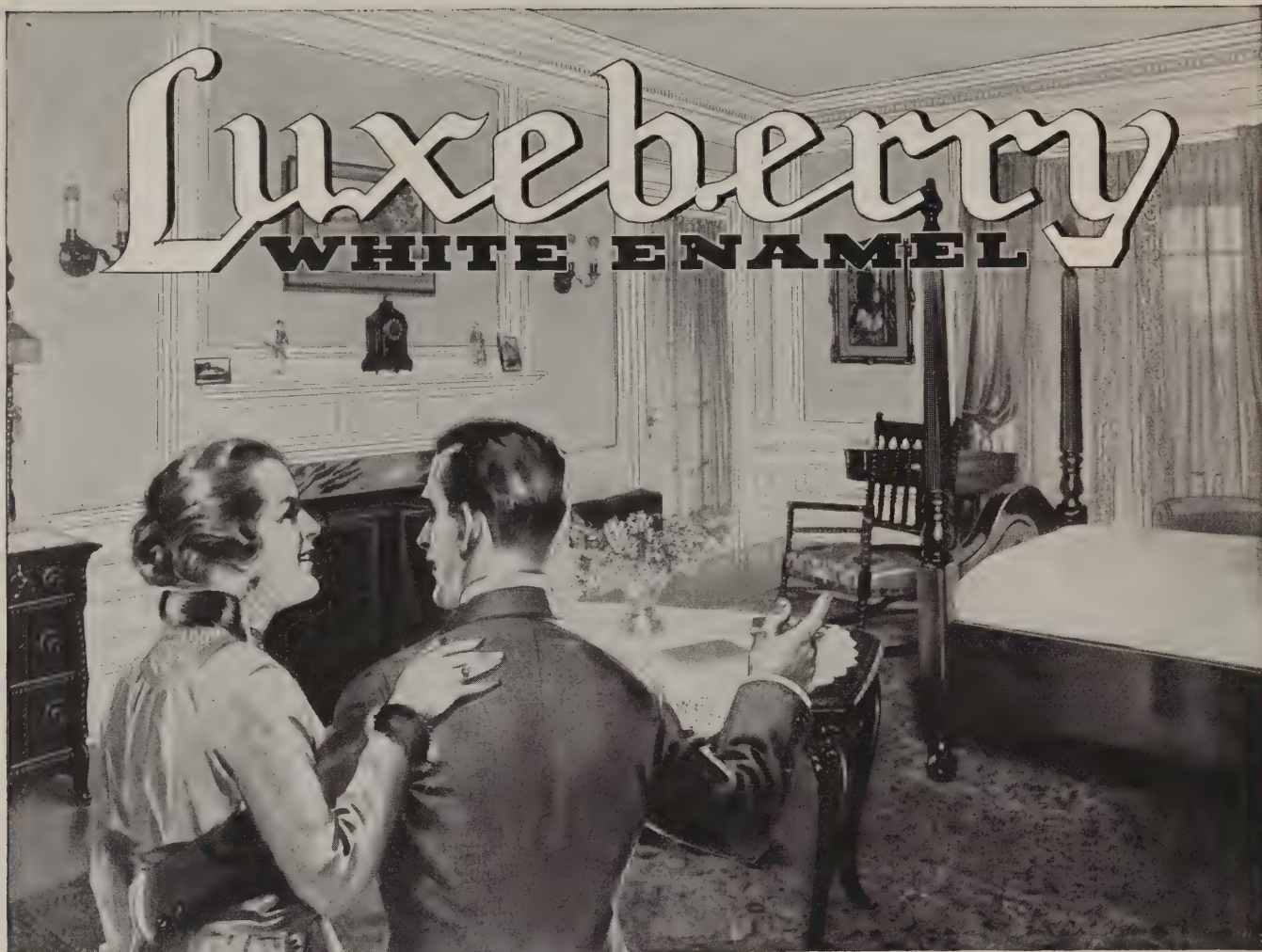
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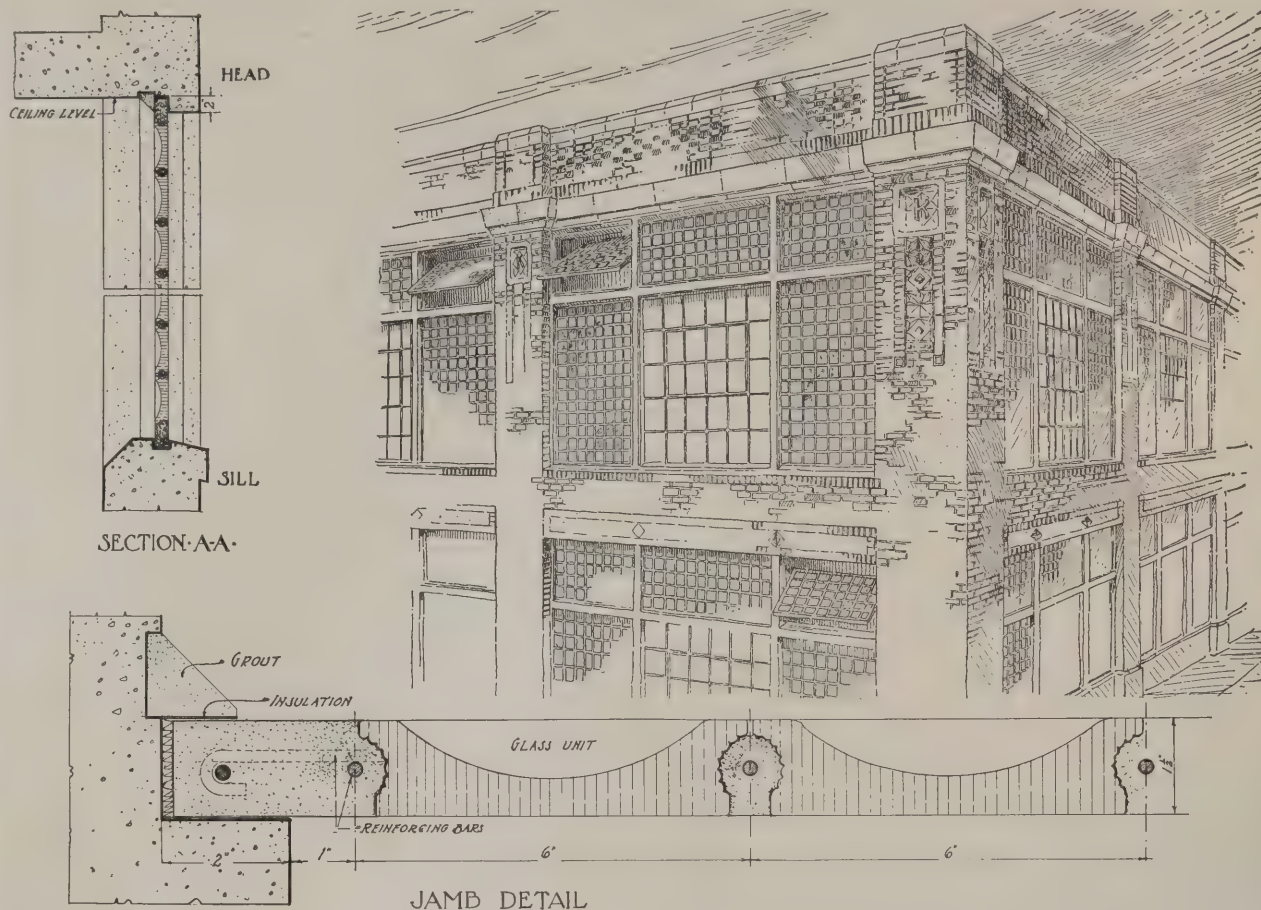
**Mechanically.**— The Wilson Louvre Blind is simple in construction, will not lower or lift unevenly, show vibration or create noise under wind pressure, and does not get out of order. It is built to withstand the hardest usage, as service tests in hotels and public buildings have proven.

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Roofs Crystal Ceilings Skylights Vaults Pavements Floors Partitions Windows

**KEPPLER**  
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Grand Street Loggia, City-County Building, Pittsburgh, Pa.  
Palmer, Hornbostel & Jones and Edward B. Lee, Associated Architects

The constructive motif is suggested by the Pantheon d'Agrippa at Rome, and finished in various shades of blue, gray and buff. Each dome is 40 by 40 feet

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**R. GUASTAVINO COMPANY**

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The first three of the eleven stories of this building are trimmed with Northwestern granite terra cotta, and the eight stories above with white enamel terra cotta. For the interior courts and penthouses, buff unglazed terra cotta was used.

The specifications for this work required unusual artistic and mechanical excellence.

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THE NORTHWESTERN TERRA COTTA CO.  
CHICAGO





THE HOTEL STATLER, CLEVELAND, O.

Architects, George B. Post & Sons    Builder, James L. Stuart

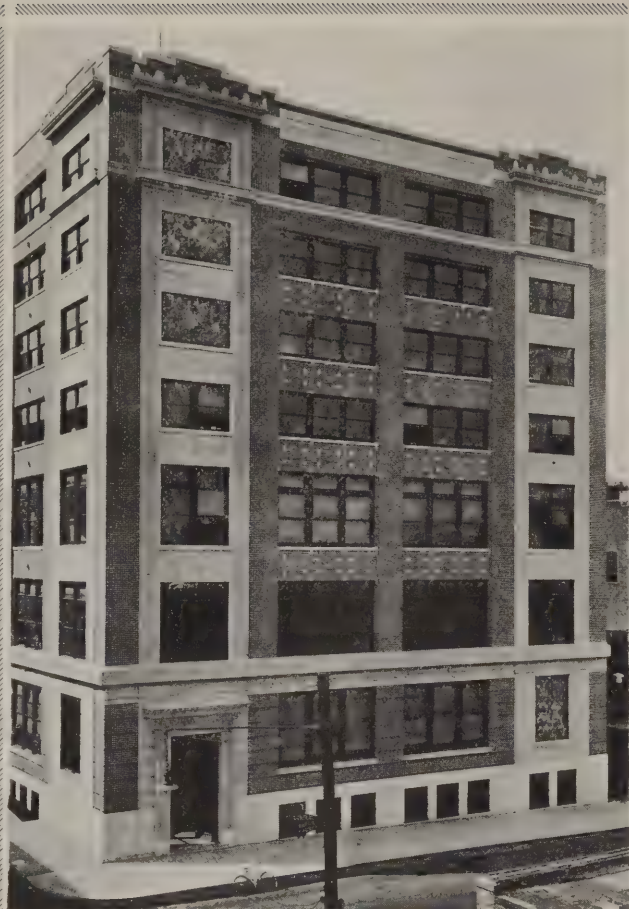
The exterior trim is Atlantic Terra Cotta finished in a gray limestone effect

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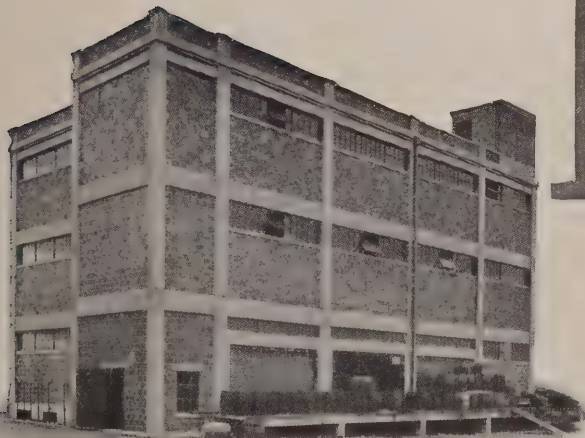
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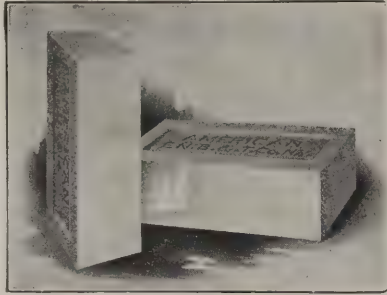
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VOLUME XXVII

NUMBER 5

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# THE ARCHITECTURAL FORUM

## FOR QUARTER CENTURY THE BRICKBUILDER

VOLUME XXVII

NOVEMBER 1917

NUMBER 5

### The Statler Idea in Hotel Planning and Equipment

#### I. INTRODUCTION

By W. SYDNEY WAGNER  
Of George B. Post & Sons, Architects

THE question has been asked, "In what manner do the Statler Hotels differ from the other great hotels which have been erected in this country during the past fifteen years; what is the secret of their success; does it in any way depend upon their planning and equipment, or is it due solely to efficient and far-sighted management after the buildings have been turned over to the owners to operate?"

Fundamentally, there is no difference between the hotels operated by this company and others planned to meet similar needs. There are, however, certain outstanding differences in the details of their planning and equipment which, in conjunction with good management and service, have spelled success.

It is the intention in this series of articles to discuss these differences in detail, and the endeavor, further, to show that these very differences, while fulfilling their primary function of giving better service to the guest, fulfil a still greater duty—that of pointing out the paths by which, I firmly believe, the final solution of the problems involved in the planning of the great modern American hotel will be reached.

Truly the hotel as it stands exemplified in this country to-day is an American invention, and like other inventions its development tends first to bewildering complexity as requirement is piled on requirement. Demands for faster planning and erection become ever more pressing, and limits of capacity recede always like a will-o'-the-wisp.

To-day, with hotels of from twenty-two hundred to

twenty-five hundred rooms' capacity planned or actually under construction; others which with five separate and complete kitchens still struggle unsuccessfully to give proper dining-room service; and not a few so planned that they must run to full capacity always or else operate at a pecuniary loss, the limit of complexity must be about reached or be at least in sight. Thereafter, like other inventions, if the hotel would avoid ultimate chaos as a result of this ever increasing complexity, it must, paradoxical as it seems, progress from this complexity to simplicity.

The path pointed out by the differences in the planning and equipment of the Statler Hotels is that of reduction in the number of essential parts, and the simplification and standardization of these parts from their greatest to their most minute details.

In order to arrive at a true understanding of these differences—of their *raison d'être*—it will first be necessary to touch upon the hotel requirements of the cities in which the hotels are located; and to expose, in a general way, the reasons why so many hotels fail to meet these requirements.

At the present time there are in operation four hotels of the Hotels Statler Company,—one in Buffalo, another in Cleveland, and a third in Detroit,—opened in the order named at intervals of about two years. The fourth hotel for this company has recently been completed in St. Louis, the formal opening being held on Nov. 10, 1917.

In each of these cities the essential requirements for a first-class hotel are practi-



Hotel Statler, Buffalo, N. Y.  
Esenwein & Johnson, Architects



cally the same. The great majority of the guests are travelers "on business"; the community itself is devoted principally to business, and its social requirements are much simpler than those of a cosmopolitan city like New York; the number of guests likely to use an hotel as a place of permanent or seasonal residence is small, and there is a decided lack of good restaurants, at least to the eye and stomach of the stranger in town. Then, too, these cities all suffer from that strange malady peculiar to most of the Middle Western cities, the periodical invasion by the seven-day locusts of America,—the unnumbered trade conventions, clubs, and societies which fill the rooms and lobbies of the hotel to overflowing for a week and then disappear, leaving the hotel almost deserted.

Given these requirements, the hotel located in a city of this character must fulfil, above all else, the function of the ancient caravansary; that is, it must be a place where the traveler can obtain shelter and rest; where if he be a merchant or salesman he can display his wares and transact his business with the same thoroughness, facility, and comfort as he would obtain in his home office or shop. It must next supply his various wants in dining-room and sleeping-room service; and if it would avoid being relegated to the ranks of the justly despised second-rate commercial hotels, it must supply this service in such manner as will remove the curse of machine made courtesy from it; in such fashion that the guest, upon leaving, will share, in spirit at least, the token of amity with the proprietor, and will look forward with pleasure to his next visit. It must endeavor to

be both for the residents of the city and for the out-of-town guests, the center of the social activities of the town. It should be capable of handling the peak load occasioned by the arrival and stay of a large convention without disturbing the comfort of the other guests. Its service, morale, and appointments, and the atmosphere of its public lobbies and dining rooms, should be such as will neither offend nor repel the woman guest, nor yet overawe the timid commercial traveler.

And not only finally, but first, last, and all the time, it must, in fulfilling the above requirements, produce a proper return upon the capital invested in the enterprise.

All of these requirements, you will say, are obvious, are axiomatic.

You cannot understand why every great hotel, involving as it does the careful investment and expenditure of large sums of money and the collaboration of many experts of various kinds in its conception, planning, erection, and management, does not of necessity fulfil them.

Go hunt out the number of hotels that do measure up to this standard and you will be surprised at the small bag.

I know of hotels which have failed in every one of the requirements mentioned; many others in one or more; and few, indeed, that have been successful in fulfilling all. The very fact that the success of the Statler Hotels has been such as to create nation-wide comment, indicates that the measure of complete success among the hotels of this country is small.

And the fact that in many financial circles hotels are considered as being a "special risk" speaks for itself.

To what is this failure due? I believe that mention of the most usual reasons for this failure is germane to this discussion, as showing that in the avoidance of the mistakes and pitfalls mentioned lies one of the secrets of the Statler system.

Often an hotel project is conceived by a promoter whose only interest lies in taking unto himself as large a promotion fee and as great a block of stock as is possible; or by a man having had some experience in hotel operation in a subordinate capacity and ambitious to become the operating head of a big, new, up-to-date hotel equal to "any in New York"; or again by a real estate agent whose interest ceases when he has pocketed the



Hotel Statler, Cleveland, Ohio  
George B. Post & Sons, Architects





Hotel Statler, St. Louis, Mo.

George B. Post &amp; Sons, Mauran, Russell &amp; Crowell, Associated Architects

large fees incident to the sale or lease of the property upon which he had proposed to build.

In each of these cases the ability of the prime mover in the enterprise lies in the fact that he is capable of bringing the *financing* of the project to a successful conclusion.

Seldom is this ability coupled with the ability, knowledge, and power of sustained interest necessary to analyze the hotel requirements of the locality, to direct the planning, equipment, and furnishing of the building; to gather together an organization, and to formulate a policy which will ensure the successful operation of the hotel for a long period of years. An owner of this type is usually dependent upon others for these essentials, and most of all upon the architect, who, in such case, is expected to assist the owner in matters of policy outside of his, the architect's, professional sphere.

But an owner of this type, blithely ignorant of the intricacies of the problems before him, seldom consults a specialist. Seldom does he select a manager or an architect capable of rendering

him this assistance or qualified to do this work.

More often the manager or architect chosen is some one who has been a necessary link in the financing chain; some one imposed upon the owner by the underwriters of the securities as a necessary condition of their co-operation; or some one selected merely through claims of friendship or relationship. In one case with which I am familiar the architect was the original promoter; in others, his appointment depended simply upon his ability to underbid his competitors in low commissions and overbid them in his offers of splitting fees with the promoters.

Often the manager selected may be a thoroughly competent one, but his appointment having been delayed until the building was in a nearly completed condition, it is impossible for him to make the changes which he may consider necessary.

Selected thus, the architect is apt to lack the specialized knowledge and office organization necessary to solve, translate into working drawings and specifications, and carry to completion the complex problem before him. Even if he be sincere in his desire to do his best, he cannot fully appreciate the prime importance of the planning and equipment; to him the architectural and decorative features of the project will assume exaggerated importance, and his efforts will be mainly devoted to them.

The operator, distracted with utterly new problems of organization and furnishing, will be unable to give the architect the necessary assistance, or, worse still, will force upon him many undigested and arbitrary ideas, which the architect without specialized



Hotel Statler, Detroit, Mich.

George B. Post &amp; Sons, Architects



knowledge cannot successfully assimilate or combat.

Again, through high cost of property, excessive promotion and financing costs, ill advised location and shape of property, extravagant building costs, or other faults, it may be impossible for an hotel, however well planned and operated, to earn more than, or even meet, its fixed carrying charges.

Finally, there is the ever present danger of the hotel handicapped in any of these ways being placed *hors-de-combat* long before its period of obsolescence has arrived, by the erection in the same city of another hotel properly planned, and having the further advantage of being "something new in town."

There are, of course, many great hotels in this country which fulfil their varied requirements and are monuments to their owners, architects, and operators, yet the evil conditions mentioned do exist to a greater extent than is generally recognized. Is it then a matter of surprise if, under these conditions, the stockholders often become the bag holders?

Too much stress cannot be laid upon the vital importance of the planning and equipment, and upon the fact that the architectural treatment of the façade and interior is of secondary importance in a problem which is essentially one of service. Any able architect can evolve at least half a dozen radically different yet entirely satisfactory schemes of façade; yet there may be, and usually is, but one adequate scheme of plan. It is assumed, as a matter of course, that any scheme of plan, to be really adequate, must, in addition to meeting all service requirements, conform to the established principles of good design.

Certain points in the architectural style of the Statler Hotels have a distinct bearing upon their

success. The character of the architecture and decoration is in sympathy with modern tendencies toward simplicity of design, restraint in the use of ornament and color, frankness in the use of materials, and fitness of furnishings. It indicates clearly that the owners and architects fully appreciate the fact that the old idea of what the public wanted, as expressed in the original decorative scheme of the Waldorf Astoria, and resulting in that noisy, but luckily short lived "red and gold period," was a fallacious one; that the public is capable of appreciating our best efforts in decoration.

In the Cleveland hotel the style used was a free adaptation of two similar classic styles—a *mélange* of the Italian Renaissance and the English Adam. It met with instant favor from the profession and the public, and was subsequently adopted for the Detroit and St. Louis hotels.

Now this similarity in style, together with a studied similarity in the forms and arrangements of the public rooms, corridors, and guest rooms, has given to these hotels a striking family resemblance. The guest arriving at one, after having stopped at another, is immediately impressed with the fact that he is again in a Statler Hotel. There is, in addition to a definite advertising value, a good deal of sound psychology in this principle of intentional similarity; yet I know of only one other chain of hotels—the Ritz-Carlton—in which there is any evidence of its recognition and use.

I believe that the responsibility for this omission usually rests with the architect, as in most cases the owner is content and often anxious to have duplicated some existing work which he—the owner—can see and indicate as being just what he wants.

But one gains the impression, from a study of contemporaneous work, that the architect fears, should he duplicate or be inspired by his own or others' executed work, that to him will attach some vague and fearful stigma of creative impotence. To avoid this, he often wanders into many dark and doubtful byways of style in order to solve the ever more difficult problem of doing "something different."

*Note.*—The second paper of this series will appear in the December issue. It will consider in detail the underlying principles of the Statler service and their reflection in the plan. The development of the typical bedroom floor plan will be treated from its first expression in the Buffalo Hotel to its latest form in the St. Louis building. —Editors.



View of Main Dining Room, Hotel Statler, Cleveland, Ohio  
George B. Post & Sons, Architects





## America's Greatest Seaside Hotel—The Traymore, Atlantic City, N. J.

PRICE & McLANAHAN, ARCHITECTS

By JOHN J. KLABER

ATLANTIC CITY, despite its great fame as a seaside resort, presents from an artistic standpoint a most disappointing appearance. Its famous hotels are for the most part only frame structures, devoid of any attempt at architectural embellishment, within as well as without. But to this rule there are notable exceptions, and a great improvement in recent years is to be noted. Several of the larger hotels have been rebuilt or added to, and the newer buildings are in almost every case far superior to the older ones. The most important of these works, both as to size and architectural character, is the Traymore, recently completed from the plans of Price & McLanahan of Philadelphia.

The Traymore, however, is not the first hotel built by these architects at Atlantic City. The Marlborough-Blenheim, now about twelve years old, is also their work, though between it and the Traymore a great progress in design may be noted. This progress is shown in several directions, including the plan, which is far more spacious in the newer building; the general treatment of the architecture, where the earlier work, almost too rococo in character, has given way to a greater sobriety; and the color, which in the Blenheim has a dominant tone of gray stucco, with rather acid green terra cotta ornaments, while in the Traymore the prevailing color of the walls is a soft, pinkish brown, with touches of yellow and green, culminating in the yellow tile domes, 234 feet above the ocean.

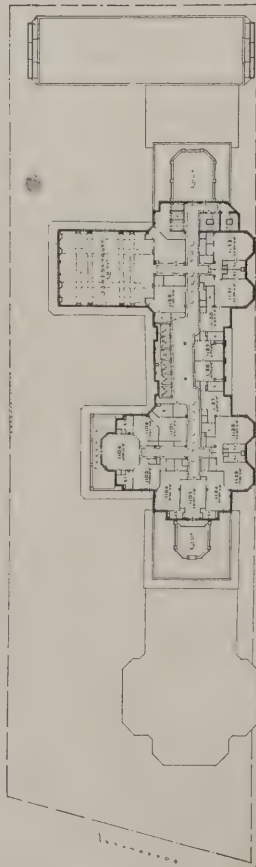
The present building was erected at two different periods, both portions being the work of the same architects. The old frame building, occupying the same site, was increased in capacity, some ten years ago, by the addition of that part of the present structure lying near the boardwalk, including the south

tower and the two bays adjoining and has now been replaced by the recently completed fireproof structure that is continued over the remainder of the site. The work is particularly notable for the speed attained in its erection, just twelve months elapsing from the time the old building was vacated until the new one was ready for occupancy.

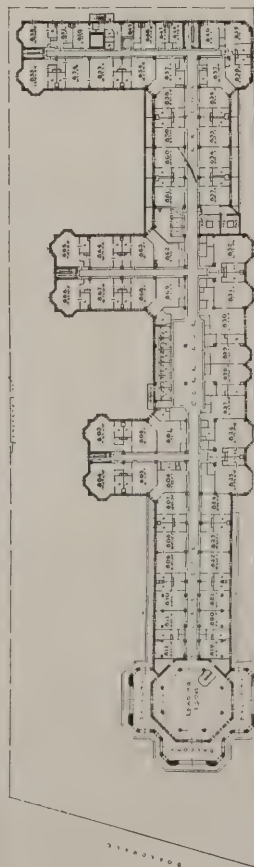
The frame of the building is of reinforced concrete, several types of construction being used in different parts of the structure, including beam and slab floors, as well as girderless floors of the mushroom type and combinations of tile and concrete; while in the columns several kinds of reinforcement have been employed, including hoops, straight rods, and steel cores where the loads were particularly heavy. The columns, moreover, are not continuous, many offsets being made necessary by the setbacks in the various fronts. The exterior walls are of terra cotta in the older part, and of brick backed with hollow tile in the newer, the two materials being, however, of the same color, so that the line of demarcation is scarcely noticeable.

The site occupied by the building is trapezoidal in plan, having a length of 523 feet on Illinois avenue and a width of 160 feet perpendicular to it. It is located at a bend in the boardwalk, and the building is therefore a very prominent object from both sides, and particularly from the west, where the adjoining space is more open. Its very unusual design has been the logical consequence of its location and importance and can fairly be considered a great triumph for the architects, who have provinced an edifice that is striking without undue ostentation or expense, and festive in character without descending to frivolity.

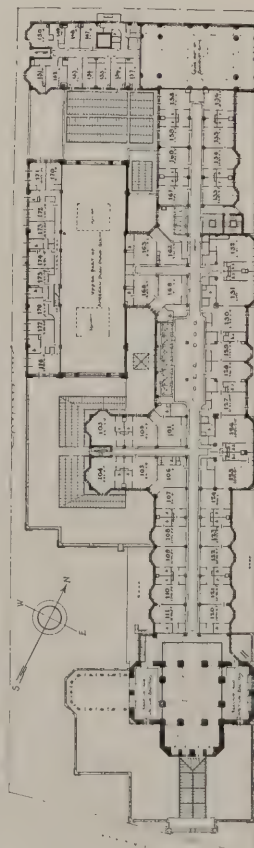
The exterior of the building is characterized by an extreme simplicity of detail, the tile inlays of the



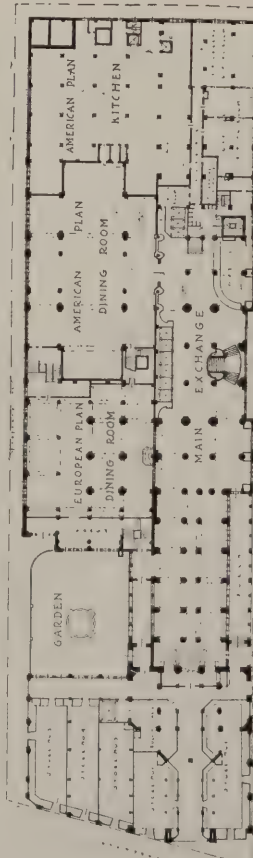
ELEVENTH FLOOR PLAN



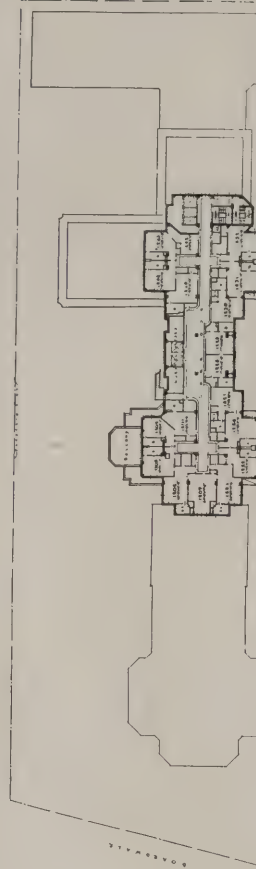
TENTH FLOOR PLAN



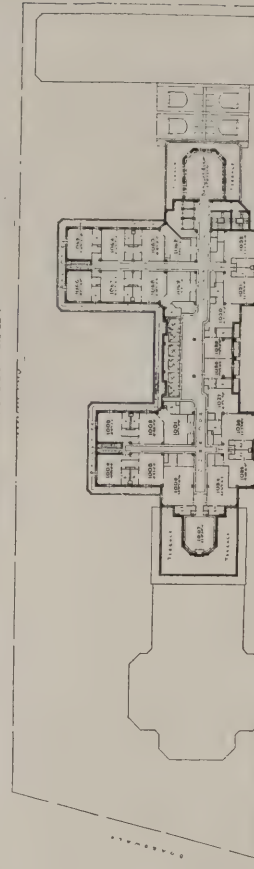
SECOND AND TYPICAL FLOOR PLAN



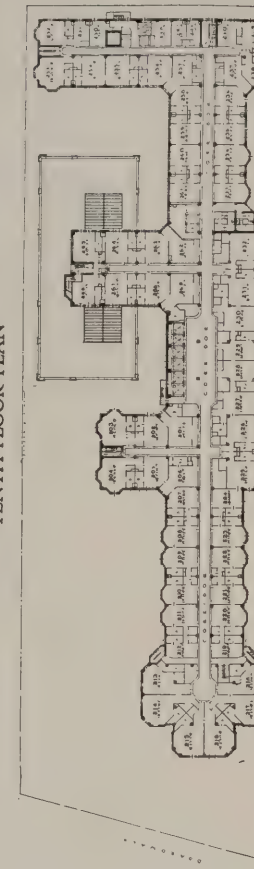
FIRST FLOOR PLAN



TWELFTH FLOOR PLAN



MEZZANINE FLOOR PLAN



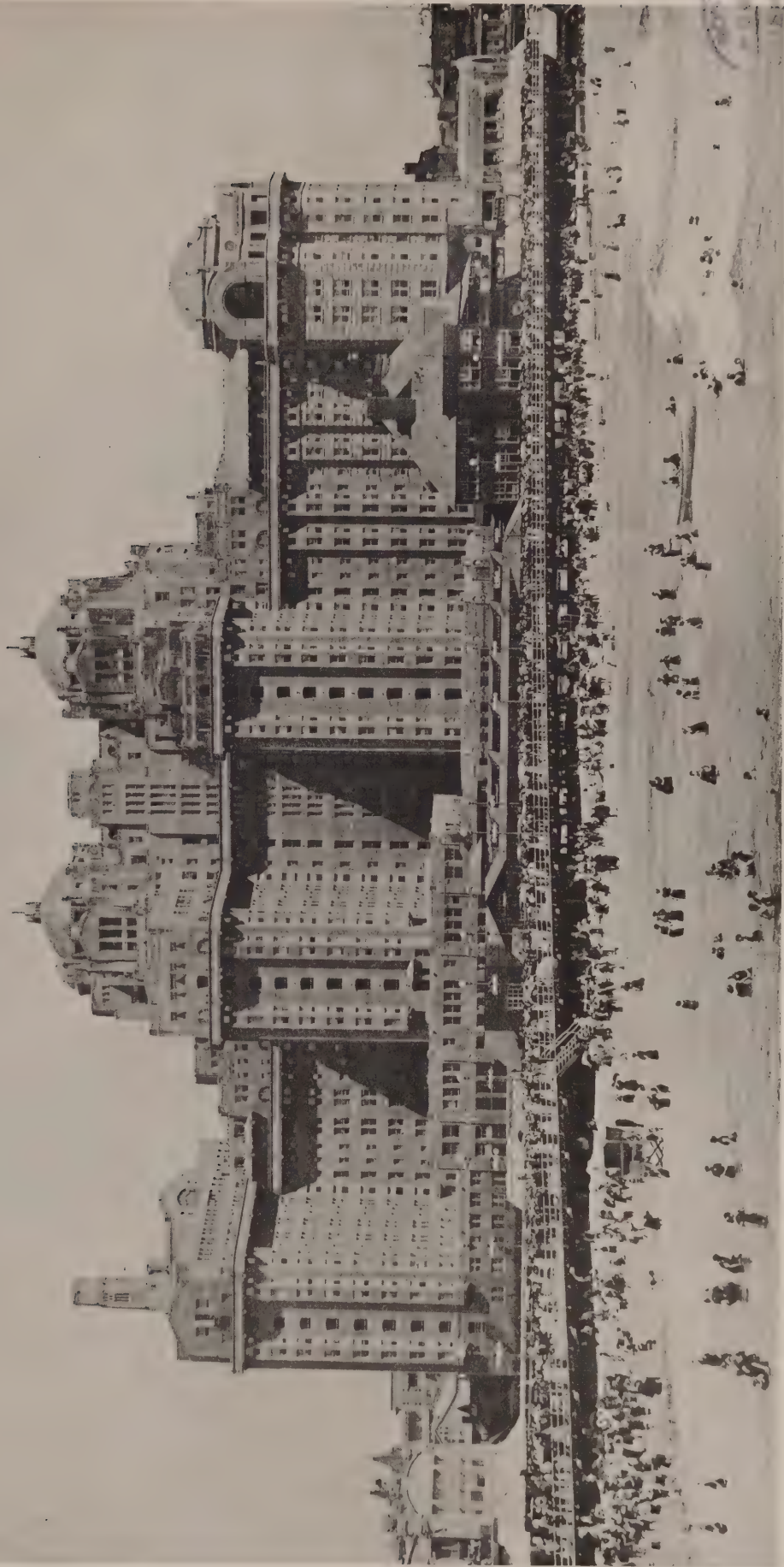
MEZZANINE FLOOR PLAN



MEZZANINE FLOOR PLAN

FLOOR PLANS, HOTEL TRAYMORE, ATLANTIC CITY, N. J.  
PRICE & McLANAHAN, ARCHITECTS





VIEW FROM THE SOUTHWEST  
HOTEL TRAYMORE, ATLANTIC CITY, N. J.  
PRICE & McLANAHAN, ARCHITECTS





View of Main Exchange

entrances and balconies being almost the only minor enrichments; but the projecting bays, the balconies that take the place of cornices, and the brilliant yellow domes with their buttresses province an effect of richness and gaiety wholly appropriate to the character of the structure.

The carriage entrance on Illinois avenue gives access to a large entrance lobby, whence a triple motive stairway, oval in plan, leads to the main exchange or Grand Promenade, as it is usually called. This is the most important room of the hotel, containing the office and giving access to most of the public rooms. It is sumptuously decorated, but without falling into the excess that is so frequent in both American and foreign hotels.

The floor of the Grand Promenade is of a veined white Vermont marble, laid in squares, with inlays of gray Knoxville and Vermont Verde Antique marble, the latter being a very dark green in color. The rail of the oval stairway is of a marble called Westland Paonazza, but which resembles rather a light Cippolino, white with light greenish veins. In the column bases the Verde Antique is again used, together with Royal Antique, a white marble with heavy black veins, the latter material being stained to a soft yellow tone. The walls and columns are plastered with a cream tone, the ceiling white plaster, with touches of yellow and gold in the inverted lighting fixtures. The caps of the columns are gilded, their sunk panels being black, to give greater relief to the leaf ornaments.

Additional touches of color are

given by the painting in the deep window recesses, and by the painted furniture, upholstered in gay cretonnes and awning striped materials, and the rugs. It is interesting to note the perfect harmony of all these elements, showing the excellent result of intelligent collaboration between the architect and the decorator. Every piece of furniture was specially designed for the building, and the result has fully justified the effort. Notable, also, is the fact that no definite historic style can be assigned to the decoration, in this or any other parts of the building. There are bits that suggest the Gothic, others the French style of the eighteenth century, others still the Art Nouveau or even the Chinese, — this last particularly in

some of the furniture, — but all these elements are combined to form a harmonious and charming *ensemble*. In a place for permanent residence it might, perhaps, be found a bit extravagant; but in a hotel, and particularly a seaside hotel, it is all that could be desired.

The main part of the promenade is divided into three equal parts by two rows of columns, while in its southern extension the spacing is changed to conform with the structural system of the older part of the building. The effect in plan is somewhat curious, but in reality, strangely enough, it is scarcely to be noticed. At the south end of the room a stairway, of the same dark green marble used in the floor, leads up to the Fountain Room in the mezzanine floor, from which one may reach the porches and terraces overlooking the boardwalk, the space under them being occupied by stores. The same stairway, by means



View of European Plan Dining Room



of its side flights, leads to a passage that opens directly on the boardwalk, forming a secondary entrance to the hotel.

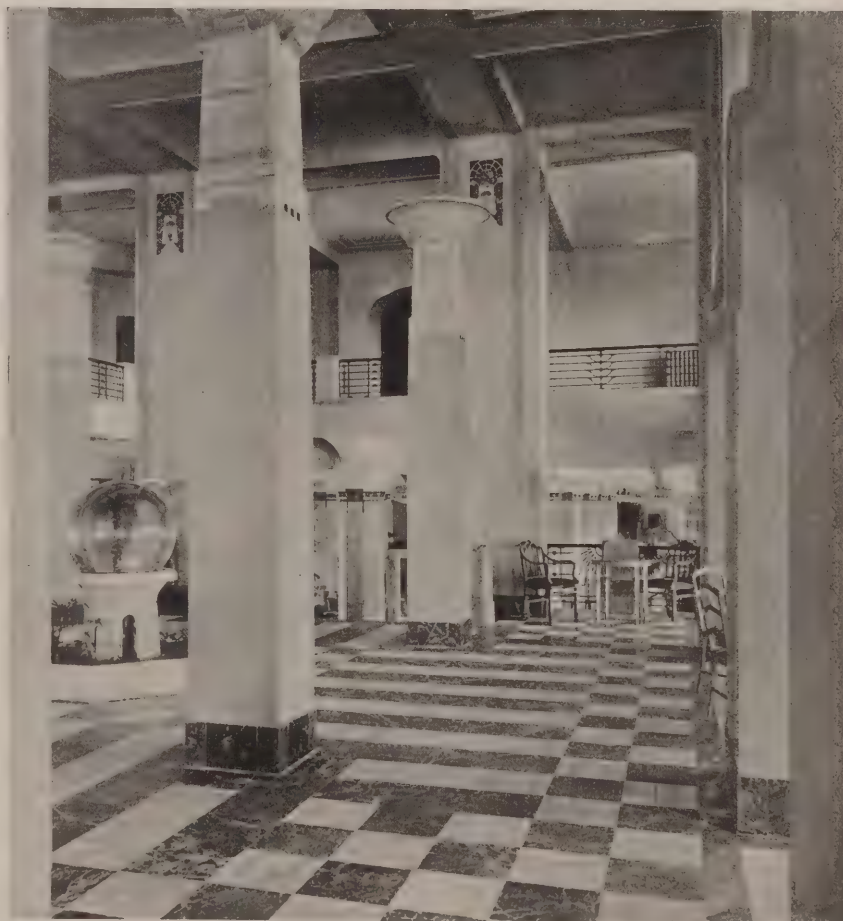
The Fountain Room continues the character of the Grand Promenade, though its proportions and detail are considerably different. The same green and white marbles are used in the floor, while the fountain and the lighting fixtures are of the same marble as is used in the oval stairway. The walls are of tinted plaster of a pearl gray tone. The main feature of the fountain is a great glass globe, filled with water by exhausting the air and communicating directly with the basin below, so that occasionally one of the goldfish finds its way into the globe, to the great surprise of the visitor, and, no doubt, to its own. The iron railings of the upper balcony, and those separating the room from the promenade, are painted a light green, while the pedestals of the latter are of a very brilliant yellow Siena marble—the only imported marble used in the entire work.

The hotel has two main dining rooms, reached from the Grand Promenade. The American plan room, the larger of the two, is simply treated in white plaster, while the European plan room, known as the Lotos Room, is more elaborately decorated in buff, old rose, and gold. Part of this room is two stories in height, its capacity being increased by the balcony at the mezzanine floor level, with a musicians' gallery at the north end. The main banquet room, known as the Rose Room from the prevailing tone of the decoration, is also located on the mezzanine floor, at the north end of the building. Among the other important public rooms is the reading room on the eighth floor, octagonal in plan, located under the dome of the old tower, with balconies opening on three sides. Its decoration is similar in character to the rooms already described, the treatment of the columns and arches being particularly ingenious and effective. For a reading room, however, it seems curiously lacking in books—a defect, to be sure, that can easily be remedied.

From the Grand Promenade six elevators, with gilded iron doors, give access to the fourteen floors of bedrooms. The typical bedroom floor shows three wings, of varying length, projecting to the west, so that the greatest possible number of rooms may enjoy a view of the ocean. The rooms are spa-

cious and are furnished in a spirit of rich simplicity, with every improvement that the management has been able to devise. Practically all of them, of course, have adjoining baths, while a few are arranged to form special suites for the accommodation of guests of special importance, or merely, perhaps, of great wealth. On the upper floors the number of rooms is reduced, as a result of the change in plan, and the number of elevators diminishes accordingly, only two of them running above the eleventh floor, though three of the four service elevators continue as far as the thirteenth.

A remarkable feature of the Traymore is the Submarine Grill, a restaurant designed mainly for dancing and supper parties, to which, unfortunately, no photograph can do justice. It is located on the ground floor under the garden court. The pool in the court has a glass bottom, so that the fish can be seen from the room below, the effect being enhanced at night by the use of searchlights on the towers, illuminating the fountain from above. It is this feature that gives the room its name, and the same idea is carried out in the mural decorations by George Harding, representing marine subjects, in which greens and blues are the prevailing tones. The central part of the floor, sunk slightly below the general level for dancing, is of Vermont Verde



View in Fountain Room Looking Toward Main Exchange



Antique marble, the rest of very small tiles, in various reddish tones, while the chairs are of brilliant red lacquer. At night, when filled with a gay crowd of summer visitors, this room represents a maximum degree of light and color.

The Peacock Room, forming the vestibule to the Submarine Grill, is also decorated with paintings by George Harding, though the subjects, as well as the coloring, are very different. Here the paintings represent the story of the Isle of Enchantment, a romance in the manner of the Arabian Nights. The general tone of the walls is a golden yellow, with much red in the paintings, harmonizing with the floor of red tile. Because of the very low ceiling, mirrors have been introduced, and parts of the decoration have even been painted upside down, so that their



View of Reading Room on Eighth Floor

reflections in the ceiling mirrors appear to be the true objects. This room is reached by stairs leading down from the passage to the boardwalk, under the stairway leading up to the Fountain Room.

When the present building was projected, its great size, far surpassing any of the other hotels at Atlantic City, caused the incredulous to predict a speedy financial disaster. Their prophecies, however, have not proven true ones. Almost from the day the new Traymore was opened it has been most successful, so much so, in fact, that plans have been made, and will probably be executed at a time not far distant, for doubling its present capacity by the erection of an additional building on the other side of Illinois avenue, connected with the present structure by bridges at various levels.



View of Main Exchange Looking Toward Fountain Room

Hotel Traymore, Atlantic City, N. J.  
Price & McLanahan, Architects



# Good-Will in Architectural Partnerships

By WILLIAM L. BOWMAN, C.E., OF THE NEW YORK BAR

FROM practically no legal value to a state appraisal of over one and one-half millions of dollars for one business, is quite a jump! Yet that represents an actual condition regarding what is now known as "good-will." When good-will was first recognized by the law, its value was restricted to commercial business, and solely to the probability that old customers would continue to come to the old place of business. At present, under the income tax law regulations, it is stated to represent the value attached to a business over and above the value of the physical property. For all purposes and conditions the best modern definition of the term is: "The advantage or benefit which is acquired by the establishment beyond the mere value of the capital stock, funds, or property employed therein, in consequence of the general public patronage and encouragement which it receives from constant or habitual customers, on account of its local position or common celebrity or reputation for skill or affluence, or punctualities, or from other accidental circumstances or necessities, or even from partialities or prejudices."

Since the general principles and the rules which are applicable to ordinary business partnerships would apply in a case where good-will in an architectural partnership is involved, let us now consider the results which can be gathered from a study of the cases on the subject.

*General Principles.* To-day good-will is an asset of any business, the value of which may be obtained by using certain well considered rules or by an actual sale. As such an asset it can be the subject of agreement in partnership contracts; it may be mortgaged or sold; it may be taxed; it may be disposed of by will; and, under certain circumstances, it may be the subject of recovery in damages where it has been lost. As the term has no meaning except in connection with a going business, in cases of bankruptcy and quarrels between partners, receivers are usually appointed at once by the court, whose chief duty is to keep the business running so that it will not lose its good-will until a sale or settlement can be effected. Upon such a sale the purchaser ordinarily acquires three incidental rights, namely: the sole right to use the old trade or firm name; the sole right to the trademarks connected with the business; the right to the benefit of contracts entered into by the seller with third parties for the protection of the business. These incidental rights are in addition to the usual rights involved; the possession of the premises and of the old stock, and the right to carry on the old business and to represent that it is the old business that is carried on.

In partnerships, unless there is some agreement to the contrary, the asset of good-will is subject to a partial ownership by every member of the firm in accordance with his percentage in the firm. Under the early law in such case it was held that when a partner died, the good-will then became the property of the surviving partners. However, that has now been changed so that asset, as well as every other asset of the partnership, must be accounted for by the surviving members. Ordinarily when a firm is dissolved, there being no provision to the contrary, the good-will must be sold for the benefit of all the partners if any of them insist on such a sale. For this reason and others it has become a common and wise practice in drawing partnership agreements to specify just what is to be done with the good-will, or how it is to be valued in such contingencies as dissolution or death. Because the English cases and some American cases hold that a retiring partner who has sold his interest in a certain business is not restricted from again engaging in a competing business, it is usual now for the purchaser to require the selling or retiring partner to sign an agreement that he will not compete with the old business, specifying either a period of time or certain territory within which he will not operate, or both.

*Professional Good-Will.* In the early days there was no recognition of good-will in the professions, and the courts consequently held that the good-will of an attorney or of a physician had no value. Of course by considering our definition hereinbefore given, it is easy to see that there could not possibly be any good-will where an actor, artist, or musician is considered. Even the modern opinion respecting individuals is that such good-will as might exist is too insignificant to be taken notice of, or not of appreciable transferable value. However, there can be no doubt that the acquiring of the old place of business of a successful professional man should have some value. Also one of the chief arguments in favor of this asset is the contention that if a man disposes of his professional business, and stipulates to recommend his clients or patients to the purchaser and practically to retire in his favor, that is a very valuable consideration which should enhance the purchase price.

Regarding partnerships or corporations doing a professional business, it would seem that the question as to existence and value of good-will would depend on the existing conditions and circumstances. Ordinarily the greater the number of partners or the larger the corporation, the more likely it would be to have a valuable good-will, because in such cases the profitable running of the business would not

depend to such a large extent on the ability, personal skill, or even personality of any one man. On the other hand, if the corporation was merely an individual incorporated to protect himself from certain liabilities, its good-will could hardly be more valuable than that which the individual would have had.

*Valuation of Good-Will.* Upon one of the early occasions when an English court recognized the fact that good-will was an asset of a business, the learned judge directed, in his ordering a partnership business to be sold, that a statement should be made to bidders respecting the profits for three or four years preceding, the names of the customers, etc., in order to give them a chance to place a value upon the good-will. From this direction seems to have risen our modern basis of valuation. For example, there seems to be a commercial custom in cases of dispute to fix the value of good-will as the amount of the net profits for three years. Naturally the valuation in each business or case must depend on its own particular circumstances and conditions; the value of a banking business has been held to be one year's average net profit, of a physician one and one-half years, and of an attorney's two years. In these cases of professional men, the estimates seem to depend somewhat upon the introduction given by the seller to the old clientele and the amount of restraint put upon the seller.

One of the few cases, where the exact data respecting the fixing of the value of good-will is stated in the opinion, involved these facts: a partnership which had done business for ten years had to be closed. The profits varied from \$30,000 to \$80,000 annually, and averaged somewhat over \$42,000 for the last three years. The court in deciding the matter approved of the rule that the value of good-will should be the average annual net profit for the last three years multiplied by such a number of years as should be considered fair under the circumstances. In this instance they used two years, and fixed the value at some odd \$84,000.

The very latest decision on valuation involved the disapproval by a surrogate in New York State of an appraisal of good-will of a business at \$1,520,000 on the ground that it was not large enough. The facts were that the business had been going since 1879, had an excellent reputation, had advertised extensively, and was very prominent in its line. The disapproved appraisal was based on five times the average net profits for the last three years. The opinion held that it should have been based on five times the average net profits for six years preceding.

In determining the value of good-will for the purpose of taxation there are many decisions holding that it should be considered as worth the price paid for it. In cases of corporations formed from partnerships or combinations where so much stock has been issued for "good-will" (by some called

"water"), this ruling has caused serious embarrassment and expense.

Loss of good-will as damages has been refused in some cases and allowed in others. For example, where property has been taken by condemnation proceedings, compensation for the destruction of the good-will has been refused; on the other hand where the owner of property leased the same, agreeing to furnish the power, and thereafter broke the lease by refusing to furnish the power, it was held that the injured business man could recover the value of such good-will as he could prove he had lost. Because of its direct application to the professional field of endeavor, the following is quoted from the opinion:

"We all know that in many, if not all, professions and callings, years of effort, skill, and toil are necessary to establish a profitable business and that when established it is worth more than capital. Can it then be said that a party deprived of it has no remedy and can recover nothing for its loss when produced by another? . . . And to measure such damages, the jury must have some basis for an estimate, and what more reasonable than to take the profits for a reasonable period next preceding the time when the injury was inflicted, leaving the other party to show, that by depression in trade or other causes, they would have been less? Nor can we expect that in actions of this character the precise extent of the damages can be shown by demonstration; but by this means they can be ascertained with a reasonable degree of certainty."

So many of the reported decisions either by arbitrators or by a jury involving this question of valuation result in the mere fixing of a figure without any apparent relation to the evidence, thus they do not help one in trying to find a general working rule. Naturally where a sale has to be made, the valuation of the good-will must depend on its actual sale value, no matter how insignificant that may be compared with its real value to a partner who might have continued the business, or compared to the value based on the usual rules of computation.

*Special Architectural Problem.* Because of the importance which is now attached to the subject and because there are practically no reported decisions involving architects, it has been deemed advisable to discuss a situation with the following general assumed facts:

For twenty-five years two partners have carried on their professional work, sharing equally in the profits. The business had only a nominal capital, not worth considering, and while one man devoted his time to procuring the business, to attending to the correspondence and superintendence of the construction work, the other turned out the plans, details, specifications, etc. There was no written agreement between them and at the end of the time the partner in charge



of the drafting room, on account of illness which incapacitated him for future work of that kind, wishes to withdraw from the firm. His request is consented to by the other partner and he is given 50 per cent of the profits of the work in hand, including even that just started. Then the retiring partner asks that he be given a further cash amount and a stated weekly sum for a period of seven years for the balance coming to him as the value of his share of the partnership assets including good-will, which demand the continuing partner refuses. Who is in the right legally?

In considering this proposition we will first assume certain facts which are important, but which do not appear in the general statement. We shall suppose that the continuing partner remains in the old offices, where the firm has been for its entire existence; that he takes advantage of the existing lease; that he takes possession of and claims ownership of all the personal property such as drafting tables, instruments, furniture and ornaments, books, records, etc., which belonged to the partnership; that the actual drafting work had for many years been done by employees, and the retiring partner's chief work had been the architectural planning and supervision of drafting-room work; that all the old employees kept their positions; that a large part of the firm's work had been of standardized industrial or office buildings and in which work the reputation of the firm was widespread and excellent; that the firm name is continued; that no notice of the dissolution is specifically given, or if it is, then it is stated that the old business will be continued at the old stand; and, finally, that the surviving partner can employ some one to take the place of the retiring partner because the work is so well organized and the employees so competent. Certainly under such circumstances the 50 per cent of profits is not sufficient payment to the retiring partner because that does not take into account his share in the personal property, assets, nor good-will. Thus the question becomes merely one of values. If one-half of the reasonable value of the personal property plus one-half of the cash on hand after the division of profits plus one-half of good-will valued at five times the average net profits for the last six years equals or exceeds the demands of cash and weekly allowance, then the demand should be granted. If the valuation of the retiring partner's interest is less than his demand, then some way should be arranged to pay such valuation as is thus found.

Now let us look at an entirely contrary condition of additional facts. Assume that the continuing partner moves to other quarters; that there are no existing contracts (other than the business work agreements) which have any value; that the retiring partner removed or took possession of practically one-half of all personal property; that the greater part of the actual planning and drafting had been

done by the retiring partner; that the employees were few and of no special importance, so that a new partner or high salaried man has to be secured to do the drafting and inside work; that the firm work had been anything they could get with no specialty or special reputation in any line; that the continuing partner uses his own name, merely stating that he was formerly of the firm; that wide publicity has been given to the fact of the dissolution; that because of dissatisfaction in the settlement the retiring partner is knocking his old partner and the business; and generally that the business has been small, local, and haphazard. Under these circumstances the retiring partner has received his share of the personal property of the firm and there would seem to be a serious question as to whether the firm ever had any good-will worth valuing. Hence the demand of a cash sum and weekly payments for seven years in this case would be ridiculous, no matter how small the sums were.

Regarding the demand for payments over seven years, of course, that would never have to be done if objected to by the continuing partner. In this connection it is interesting to find that in two reported cases respecting the dissolution of partnerships of attorneys, one contract provided, where the partnership was for life, that the survivor should pay the widow an annuity of \$1,000 payable semi-annually during the joint lives of the widow and surviving partner, and the other contract provided where the term was ten years, that the continuing or surviving partner after five years of the partnership had existed, should pay \$1,750 annually out of the net profits for a certain period, or \$1,250 on the same basis for a certain other period. It is, therefore, safe to say that had the retiring partner made a provision in an original written partnership agreement for such an annuity as he asked for a period of seven years, there is no doubt but what he could have enforced his right by legal proceedings if the continuing partner refused to perform.

In conclusion, we have seen that under the last stated additional facts, it was proper for the continuing partner to refuse the demands of the other partner. This would probably result in a court ordering him to account for the value of the good-will which should be met by the demand for a sale of the same which would bring little or nothing. On the contrary, with our first additional assumptions, it might very well be that the continuing partner by acceding to the demands of the other partner would save money, even if it were only the interest on the deferred payments. Under any ordinary conditions he would owe the retiring partner more than the 50 per cent paid, and a reasonable settlement, so as to have the good wishes and continued friendship of his former associate, should be the chief aim of the continuing partner.





WELL HALL, BRITISH GOVERNMENT HOUSING DEVELOPMENT AT WOOLWICH, ENG.

The development comprises some sixteen hundred houses of permanent materials. There are four types, varying from two rooms to four rooms and bath. The work was carried on under the direction of H. M. Office of Works and is notable for its adherence to the traditions of English rural architecture.

*Courtesy of the Journal of the American Institute of Architects*



# Industrial Housing

## NOTES ON THE SIXTH CONFERENCE OF THE NATIONAL HOUSING ASSOCIATION

By CHARLES C. MAY

THE program of the Sixth Conference of the National Housing Association as carried out at Chicago on October 15, 16, and 17 was a reflection of present conditions obtaining in this country due to the abnormal demands placed upon our industries to supply the necessary equipment for our own fighting forces and those of the allied nations. The compelling requirements of the present were squarely faced by the conference and in doing so they were made its opportunities.

As war work must be accorded right of way over every other activity, so one would expect that those most actively engaged in it would have least time to stop for discussion. We were not surprised, therefore, on the evening devoted to "Housing as a War Problem," to find that of five speakers whose names appeared on the program, viz., Mr. Charles H. Whitaker, Mr. Philip Hiss, Mr. Frank Morrison, Mr. Grosvenor Atterbury, and Mr. John Nolen, four of the five were unable to be present. And the following evening, when Major W. A. Starrett was to tell of "The Housing of the New Army," no delegate breathed freely till Major Starrett was inside the room and the door closed.

With the exceptions noted, absences were few, substitutions satisfactory, and the program completed in unruffled fashion. True, there were occasional ripples on the surface of its calm, as when a discussion brought out the statement that among the employees of a certain company, "54 per cent were married and 46 per cent were skilled," which recalled that housing reformer in New York, who, in an impassioned plea for model tenements, testified that investigations had disclosed shocking conditions — "If you will believe it, sir, three and four sexes occupying the same room."

This year's conference was notable in the composition of its audiences. Time was when such gatherings attracted almost exclusively those whom outsiders class as "housing reformers." Their proceedings, too, have been regarded by outsiders as inclined toward the academic, as having a tendency to look aside somewhat from practical considerations in their aspiration toward the ideal. The criticism may never have been well founded; happily, its justice need not now be argued because the charge is dead and out of court.

At this year's conference there were four rather clearly defined groups: first, there were housing experts, health officers, and social workers — those, in other words, who were interested in the worker and his home from the social point of view; second, there were architects, town and city planners,

or those interested from the professional point of view; third, there were manufacturers, owners of industrial plants, whose interest was that of the employer of labor; fourth, there were real estate men (or realtors, recognizing their distinction as socially minded operators), also contracting builders, and representatives of building specialties, materials, or processes.

The presence of these third and fourth classes must be regarded as of particular significance. This is not so much because it indicates a live interest among industrial leaders; in housing matters — that has long since ceased to need proof — it becomes trite. The point is that these employers of labor have come to recognize the National Housing Conference as the clearing house for facts, experiences, and constructive thought, as well as for experiments, theories, and ideals. And, moreover, it means that the conference has become a place where business, aside from that printed on the program, is being transacted.

Not the least interesting feature in this gathering, so composite as we have shown, in its make-up, is its persisting reflection of locality. Year after year it assembles to thrash out a little further the old problems and to tackle the new ones; year after year crops out the ancient provincial tendency — supposedly supplanted long since by the wider-seeing acknowledgment that the local solution is, or ought to be, merely the best expression of the local set of conditions, the local psychology, and the local requirements — not a panacea adopted in national conference and applicable universally to any and all special problems. Yet we find reappearing, certain as the hardiest perennial, the old divergences: the idealist who views with suspicion any suggestion toward curtailment of the æsthetic, any abridgment of the worker's right to his share of the beautiful. Over against him stands the hard-head who would rigidly and frankly eliminate all attempts toward amenities, furnishing to all workers alike the bare-boned necessities of shelter, leaving individual initiative to supply the non-essentials or not, as his own genius might dictate. We have, too, the disciple of the single-family house for every worker. No laborer, they hold, but should have his own lot with open spaces on both sides of his house, flowers at front, vegetables at rear, vines over the porch — all this without and no boarders within. Over against him stands the advocate of the terrace type of attached houses. He stands firm in his conviction that the worker loses little or nothing under the greater stringency of urban or semi-urban condi-

tions, in exchanging the independent for the party wall, the strip of land at each side for the protection and economy of his neighbor's warmth. Besides these, there are the half-dozen minor preferences and localisms which still serve to differentiate the Bostonian from the Philadelphian, the Easterner from the Chicagoan.

These points of distinction are noted by no means in a spirit of criticism. They are mentioned partly because they serve to explain a certain haziness that obtains in some of the discussions, and partly in the hope that out of them may develop some constructive suggestion for future lines of conduct.

Following an address of welcome by the Mayor of Chicago, it fell, as in other years, to Mr. Lawrence Veiller to open the conference by summarizing the year's activities, its gains and setbacks, its present status, and its immediate outlook. His figures mounted to an imposing aggregation: fifty-nine cities newly and actively interested in the housing of their citizens; twenty-six cities newly embarked upon campaigns for more houses; twenty-seven newly organized housing companies, using that expression as distinguished from real estate concerns in the old, time dishonored sense. Of all the two hundred and thirty-six organizations devoted to improved housing, the Bridgeport Housing Company was characterized as the most important. Organized to take care of a year's influx of 30,000 to 50,000 people, and undaunted by its job, this company, says Mr. Veiller, already "points the way to all other communities suffering from a housing shortage."

The secretary's list of cities, where industrial developments were advancing, was a long one. Among them, Bristol, Derby, Waterbury, and Bridgeport in Connecticut; Elmira and Rome in New York; in Pennsylvania, Ebensburg, where remarkable claims in economy are made for a new type of brick house, — five rooms, without plumbing, but otherwise good, — also Chester, where four hundred houses are going up; Kistler, Mocauqua, a coal-mining development by Grosvenor Atterbury and Allwood, a very thoroughly studied project, with a general town plan by John Nolen, the engineering problems under Morris Knowles, the architecture by Murphy & Dana, and the social features guided by John Ihlder; in Ohio, Akron, where building is done on a broad and ever broadening scale, and Youngstown, which contains some of the most interesting work of the time, described in greater detail below; besides these, Erwin, Tenn., where Mr. Atterbury is completing a first group of fifty houses for the Carolina, Chinchfield, and Ohio Railway; Beloit, Wis., where George B. Post & Sons are working out a development of one hundred and fifty-two houses, and Flint, Mich., whose new housing company organized with a capital of \$200,000, has acquired four hundred acres of land for its initial adventure.

The record of housing surveys of the past year includes those at Amsterdam, N. Y., and at Millburn, N. J.; an investigation of Rural Housing Conditions by Miss Hedley; a report on housing in South Bend, Ind., originally compiled by Miss Elinor Wolf, later verified and emphasized by the office of the Surgeon General; a housing survey of Fitchburg, Mass., conducted by Arthur C. Comey.

Of cities suffering more or less acutely from lack of facilities, Mr. Veiller refrained from reading a list of seventy.

On the side of improved housing legislation, the banner for the year goes to Michigan, apparently without a rival. That state now possesses a law, applicable to all its twenty-nine cities of 10,000 and more, which was declared the best in the entire country. The city of Detroit is trebly fortunate, since the identical law was adopted by the Detroit Board of Health and the Detroit Common Council, so that should the state law be repealed, Detroit could still have her second and third lines of legislative trenches to fall back upon. Of the cities, Minneapolis is to be congratulated upon possessing an advanced housing code, closely following the state law for Michigan.

Around the first-day luncheon tables, rapid-fire reports from local delegates supplemented the secretary's report in forming a picture of the whole housing situation from an almost national point of view. Only a few of the most salient points may be touched upon here. Chicago, unique among the cities, not only disclaims a housing famine — she declares an over-supply to the tune of 30,000 vacancies. Philadelphia, always a leader in social crusades, proclaims her victory in the "Thirty Years' War" on hogs — exeunt last June, to return no more, 34,000 of them. On the constructive side she is buckling down to the problem of absorbing 25,000 workers who will presently be engaged in the shops of the International Ship Company. New York City, like Cincinnati, proposes to put into operation in its Tenement House Department a vacancy bureau that will seek though compiling a "white list," to bring the deserving tenant into touch with the desirable tenement. Boston, on the one hand, perplexed in its struggle to rid itself of the three-decker problem, or even properly to inspect its 36,000 of them, on the other hand is proud at having eliminated forever the worst slum within its boundaries; and as the headquarters of the Massachusetts Homestead Commission it is likewise proud, with certain mental reservations, of the first experiment in this country of governmental housing of workingmen. The mental reservations occur, as humanly inevitable, because of the length of time and the superfluity of effort that have been necessary to bring the project through Supreme Court procedure and constitutional amendment up to its present state of contract letting; and, moreover,



having traveled that path, because of the paucity of the financial grant (\$50,000) with which to put into operation so radical an innovation. Toronto, for another instance, has enacted a new building by-law through which the smallest room used for living purposes must contain not less than 100 square feet of floor area—a requirement, by the way, which would by no means receive unanimous indorsement by housing experts in this country. Another provision, enforced when the city condemns privy vaults and replaces them with approved plumbing facilities, enables the financial burden to be lightened for the owner by being spread over five years; furthermore Toronto is the possessor of a housing company, in effect underwritten by the municipality to 85 per cent of the value of its properties, which has already to its credit of performance two hundred and fifty flats completed and occupied, and setting standards for the city. And lastly, Madison, Wis., whose delegate stated a fact too often lost sight of—that many times the investigator of housing finds the worst conditions in the smallest towns.

When New York's city planning commission set out a year or two ago to push its ordinance for the creation of use, height, and area zones, success hung in the balance until its members had succeeded in winning over and allying with themselves the real estate interests of the city. It was a prime illustration, in the field of city planning, of the broad principle which, in the field of housing, has been called "the first step toward a solution." "We must," says John Nolen, "in some thoroughgoing way convert the great forces, working through regular channels, which now produce bad housing, to produce good housing, and we must do it by bringing into control and co-operation with them the forces that believe in good housing and will gain from it, which are mainly the manufacturing and business interests that depend upon the efficient and happy workman. This great change in housing methods will come, if it does come, from the substitution for exploitation and excessive return, of the reasonable profits of business, from the transfer of housing from the field of speculation to that corresponding to legitimate manufacturing."

Examples that illustrate the spread of this gospel were cited at the National Housing Conference in the existence of a Housing Committee in the National Association of Real Estate Boards, and the presence of its chairman and sponsor, Mr. Fred G. Smith, at the conference. Not so encouraging was the fact that after the Michigan law was enacted a canvass of the state showed that the rank and file of real estate men were totally unaware of its existence. Deplorable as is such a circumstance, its importance must not be exaggerated. It is little more than a guiding finger to point out the primary line of activity to the newly formed Housing Committee. On the other hand, the significance of this parent

committee and its offspring—the local committees which are formed throughout the country—can hardly be overestimated. Wherever the enactment of a new housing code may be projected, the Housing Committee of the real estate board should form a nucleus of informed, constructive thought and influence, pledged by the resolution creating it to co-operation in the work of housing reform. These are good signs. The great body of real estate men, possessed of high ethical standards, is tiring of being classed with the real estate speculator. Henceforth they are realtors.

The Monday evening session was devoted primarily to consideration of "Housing as a War Problem." It was in a large sense the keynote for the whole conference, not only because of the huge number of new housing problems that the war has thrust upon us, but because all housing is to-day a war problem. From the largest to the smallest, vast development or single tiny unit, all are hedged about by war conditions.

Nor will the abnormalities pass away when war ceases. Mr. Charles H. Whitaker's paper was clear upon this point. "Present conditions," said he, "are only acute manifestations of a chronic disease." The trouble has been upon us these many years, yet because responsibility was nobody's, we had failed to make a diagnosis. Only with the coming of the war has the housing problem been translated into terms that can be measured. When lack of houses means lack of munitions, and that in turn, a delayed decision with increased toll of American lives, then even the slow mind of democracy perceives that the problem transcends private or municipal endeavor and challenges attention from the national government. Standing alone among first-class nations, in never having given serious consideration to governmental aid in the housing of her workingmen, America, it would seem, must now pay penalty for her inexperience by being forced to work out ways and means under the pressure, haste, and confusion of the present emergency. That governmental aid is required, is no longer considered debatable among those most closely in touch with the situation. This does not mean that the federal government must assume the rôle of house builder and owner, though England has not hesitated so to do; nor is it clear exactly to what extent it will be wise for our government to underwrite private enterprise. It may be, not improbably, that governmental aid would best be limited to the guarantee of that margin of difference which separates the actual return that can be gained from investments in good housing under present conditions, from the normal return at which private capital could to-day be attracted into the field of housing. Even should such guarantee have to be written off against the war account, action would be amply justified in that it

will have forestalled a stagnation in essential production, which would have been intolerable. The threat of partial paralysis is a real one, for nothing is more certain than that under present uncertainties, private capital cannot be made available.

Such is the situation at the moment. It is developing with amazing rapidity, so that while Mr. Whitaker's paper as written, and read at Chicago, is authoritative, yet when reviewed and published a month later, his words may have become obsolete or inadequate.

Mr. Whitaker's paper was supplemented by that of Mr. Hiss, who has been actively engaged in the collection of data for the Housing Subcommittee of the Council of National Defense. Obviously, his paper was necessarily couched in general terms in that it could neither encroach upon the report of his own committee nor anticipate possible action by the higher governmental body.

The place set aside for Mr. John Nolen's paper, "What England has Done in War Housing," was ably occupied by Miss Harlean James, who has been associated with Mr. Hiss in his investigations.

England, it seems, has passed through successive stages in her attitude toward housing for her workers. In the early days of the war, attention was not immediately drawn to the housing problem, because trouble was anticipated from a totally different quarter — that of general unemployment. Later, as the war industries multiplied prodigiously, in undreamed of volume, it gradually became evident that no such unemployment was to occur; that war industry would readily absorb all available labor, and that without exhausting its capacity.

Having early been granted power to take over land for governmental use, the next regulation affecting the housing of workers was that which forbade the raising of rentals. There was a period of apparent success, followed shortly by the realization that the law was not working according to expectations. It transpired presently that wholesale subletting at high premiums was going on, until the legally fixed and published rentals had little relation to actual conditions. An official inquiry into this situation and the resulting social unrest brought to light a serious shortage of houses. This period, too, brought out into sharp relief the fact that beyond a certain point the production of munitions was dependent upon, and must be reckoned in terms of, the number of available dwellings for workmen.

Two important steps were taken: first, laws were passed to make available all existing facilities — laws, that is to say, for billeting of government laborers: second, England set out herself to supply the needed dwellings. The obvious, superficial method would temporize with the situation, using frankly non-permanent construction of the cheapest initial cost, attempting no solution of the problem beyond a palliative to tide over the immediate emergency. But little deeper study was necessary to prove the inadequacy and short-sightedness of such a program, and England's policy is definitely on the side of permanence in all housing developments where there appears the slightest prospect of a continuing, post-war industry.

The reasons for the decision are simple: these groups of dwellings amount in many cases to new towns or sections of towns requiring, therefore, provision not only of the housing facilities themselves, but all the public utilities, — water, sanitary and storm water drainage, gas and electricity, besides the street layout and site planning — the problem, in other words, is one of town-planning as well as housing. The aggregate cost of these necessarily permanent provisions is so large that it immediately proves uneconomic to place temporary buildings on the lots. Other objections to the non-permanent type of house include the problem of disposal after the war, small amount of salvage, and danger of deterioration into slums in case the "huts" are not promptly scrapped.

In the minority case where England has used temporary housing — "huttage" as they call it — there are three principal types: first, a semi-detached single family dwelling of three rooms in each half; second, a larger type of house, used primarily as a small "hostel," where a man and wife may keep house for eight or ten lodgers. This type is used, too, for officers' quarters, and sometimes, by conversion, for single families of large numbers; third, a larger form of hostel or small barracks.

Some of the permanent developments are remarkable achievements, judged both by speed of execution and by the successful result. The best examples, called by Mr. E. G. Culpin, "easily the first thing in cottage plans and elevations for the whole world," is Well Hall, at Woolwich, outside London, a description of which, with plans and illustrations was published in the September issue of the *Journal of the American Institute of Architects*.





VIEW OF MAIN FACADE

PUBLIC LIBRARY BUILDING, SAN FRANCISCO, CAL.

GEORGE W. KELHAM, ARCHITECT







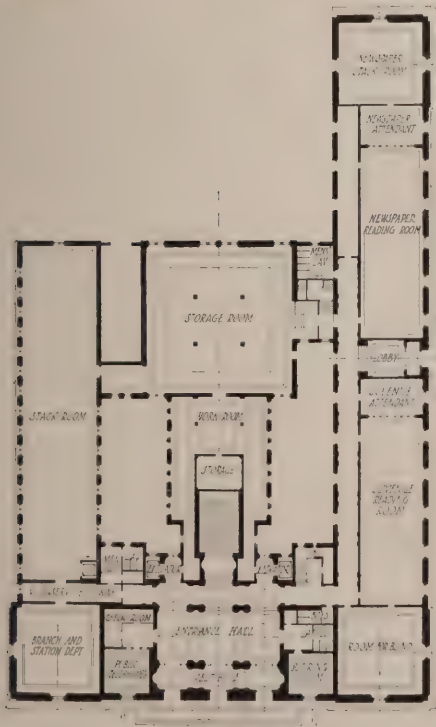
DETAIL OF MAIN FACADE  
PUBLIC LIBRARY BUILDING, SAN FRANCISCO, CAL.  
GEORGE W. KELHAM, ARCHITECT



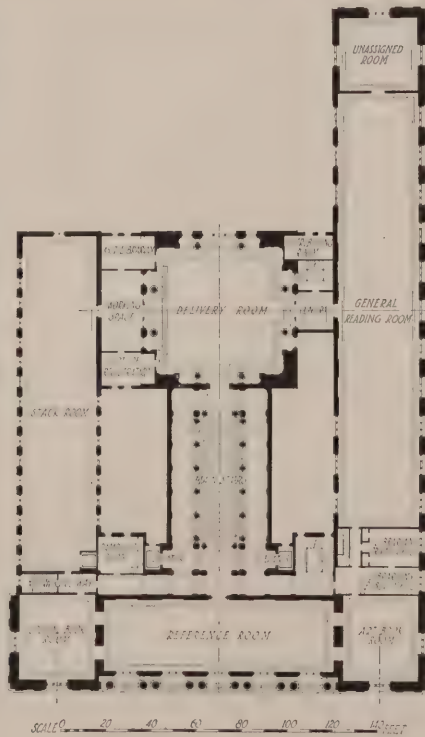




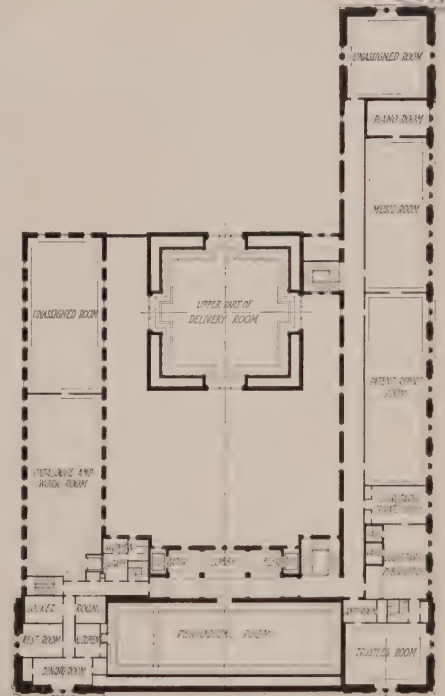
FULTON STREET FACADE



FIRST FLOOR PLAN



SECOND FLOOR PLAN



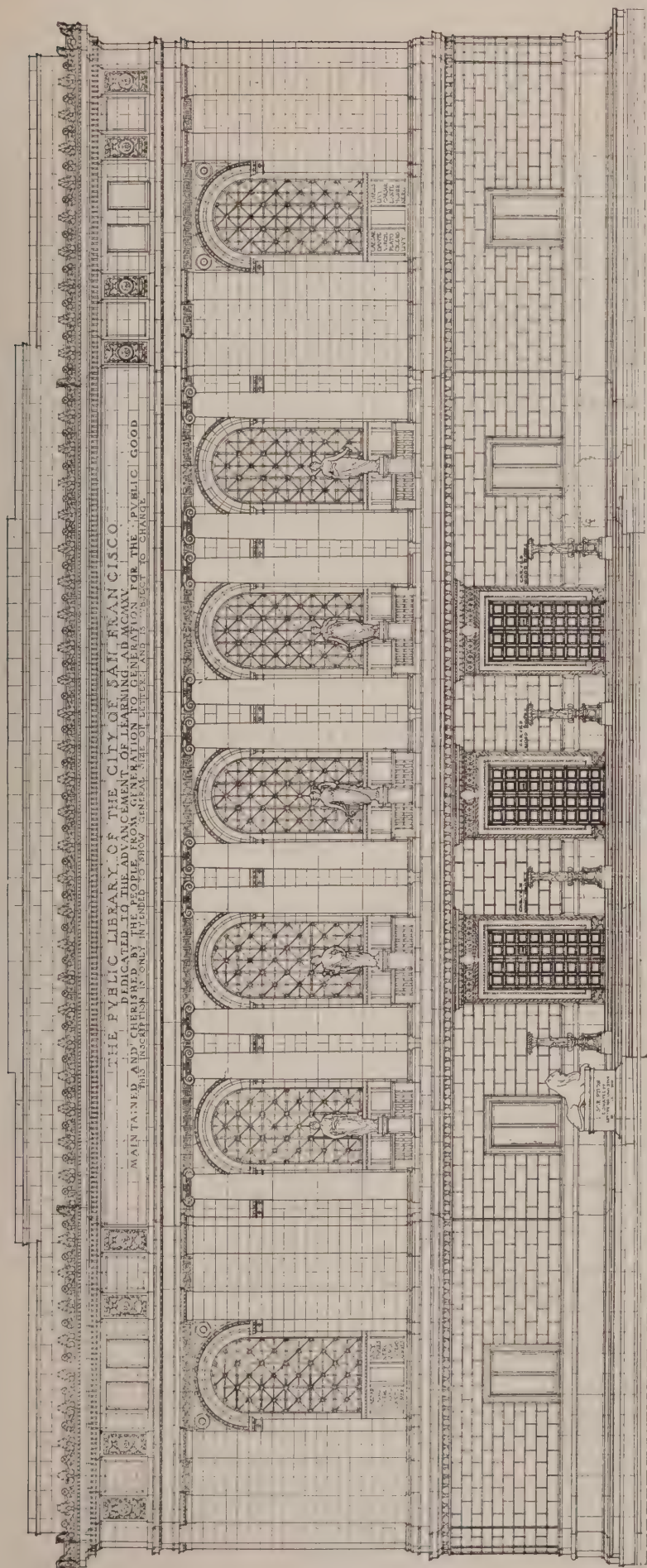
THIRD FLOOR PLAN

PUBLIC LIBRARY BUILDING, SAN FRANCISCO, CAL.

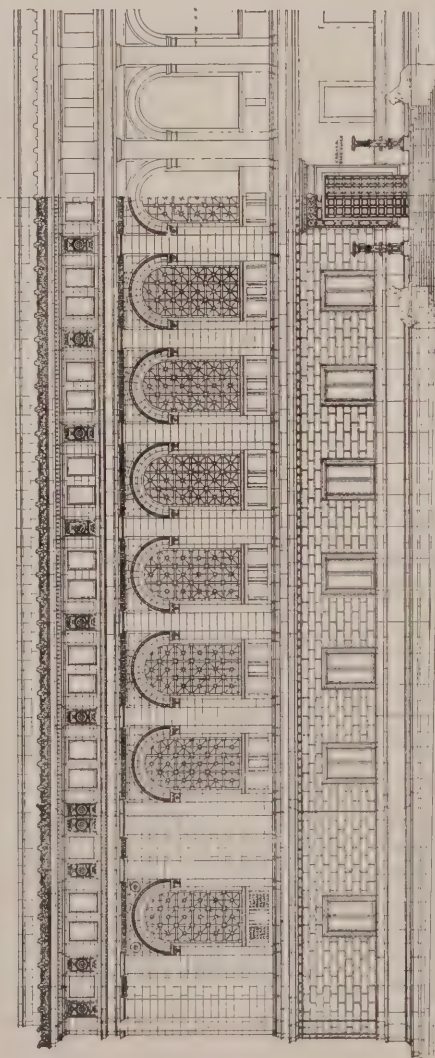
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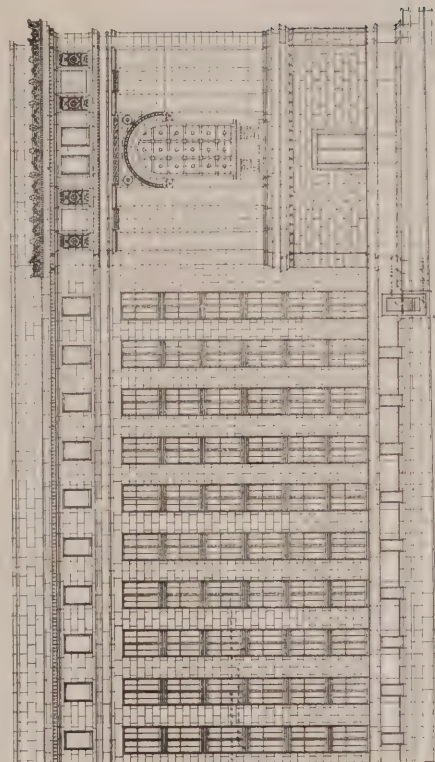




LARKIN STREET ELEVATION



PORTION OF FULTON STREET ELEVATION



PORTION OF McALLISTER STREET ELEVATION

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ENTRANCE HALL

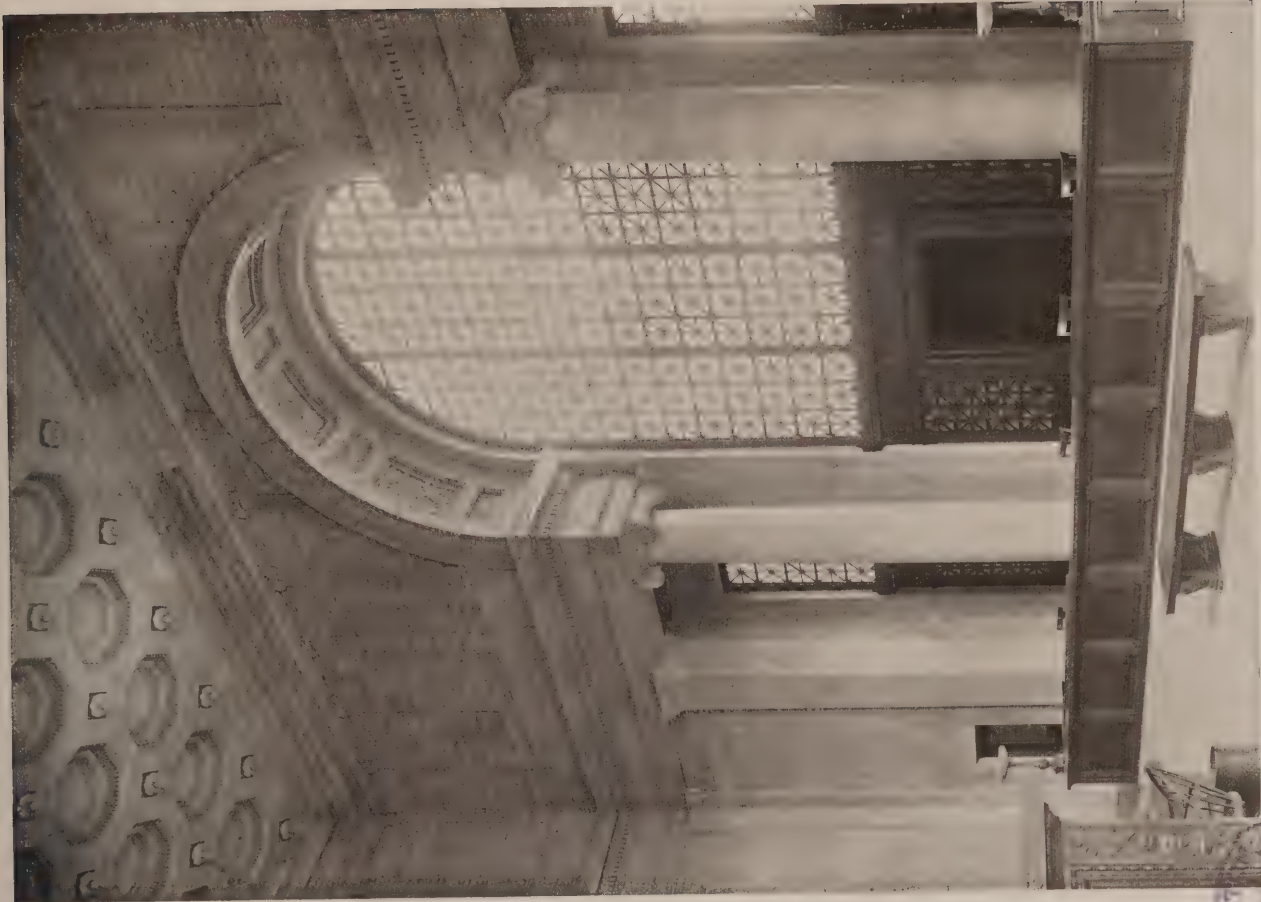


STAIR HALL

PUBLIC LIBRARY BUILDING, SAN FRANCISCO, CAL.  
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DELIVERY ROOM, LOOKING TOWARD DESK



DELIVERY ROOM, LOOKING TOWARD ENTRANCE

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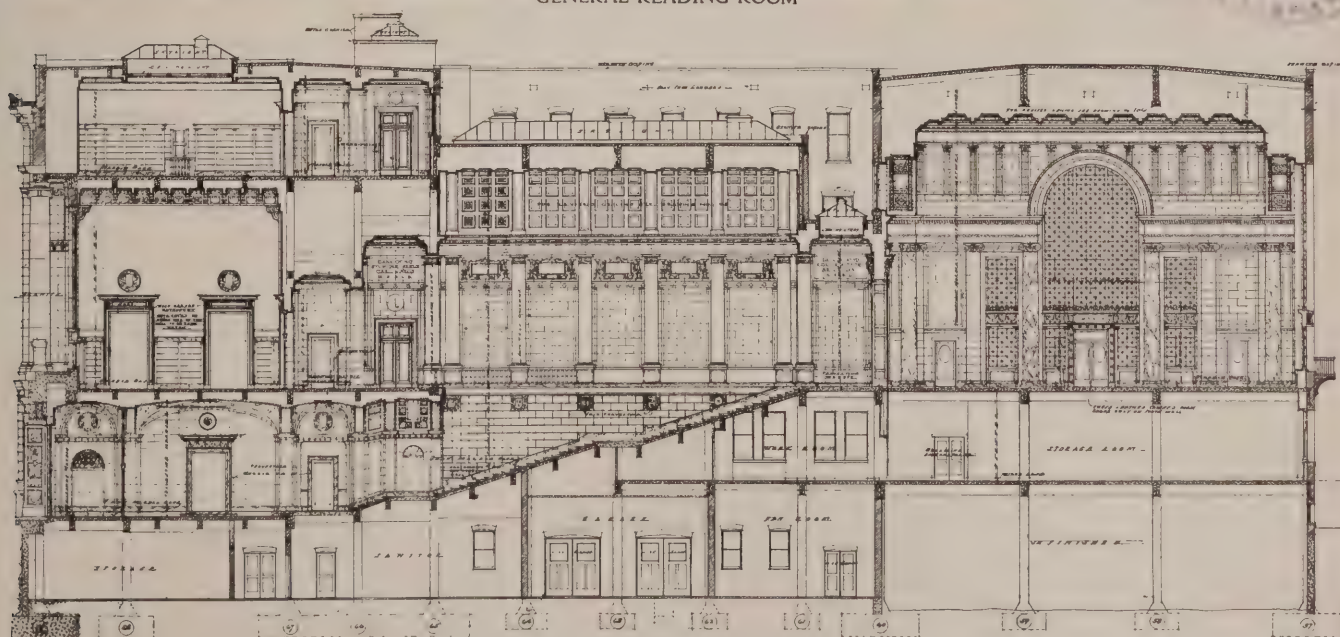
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GENERAL READING ROOM



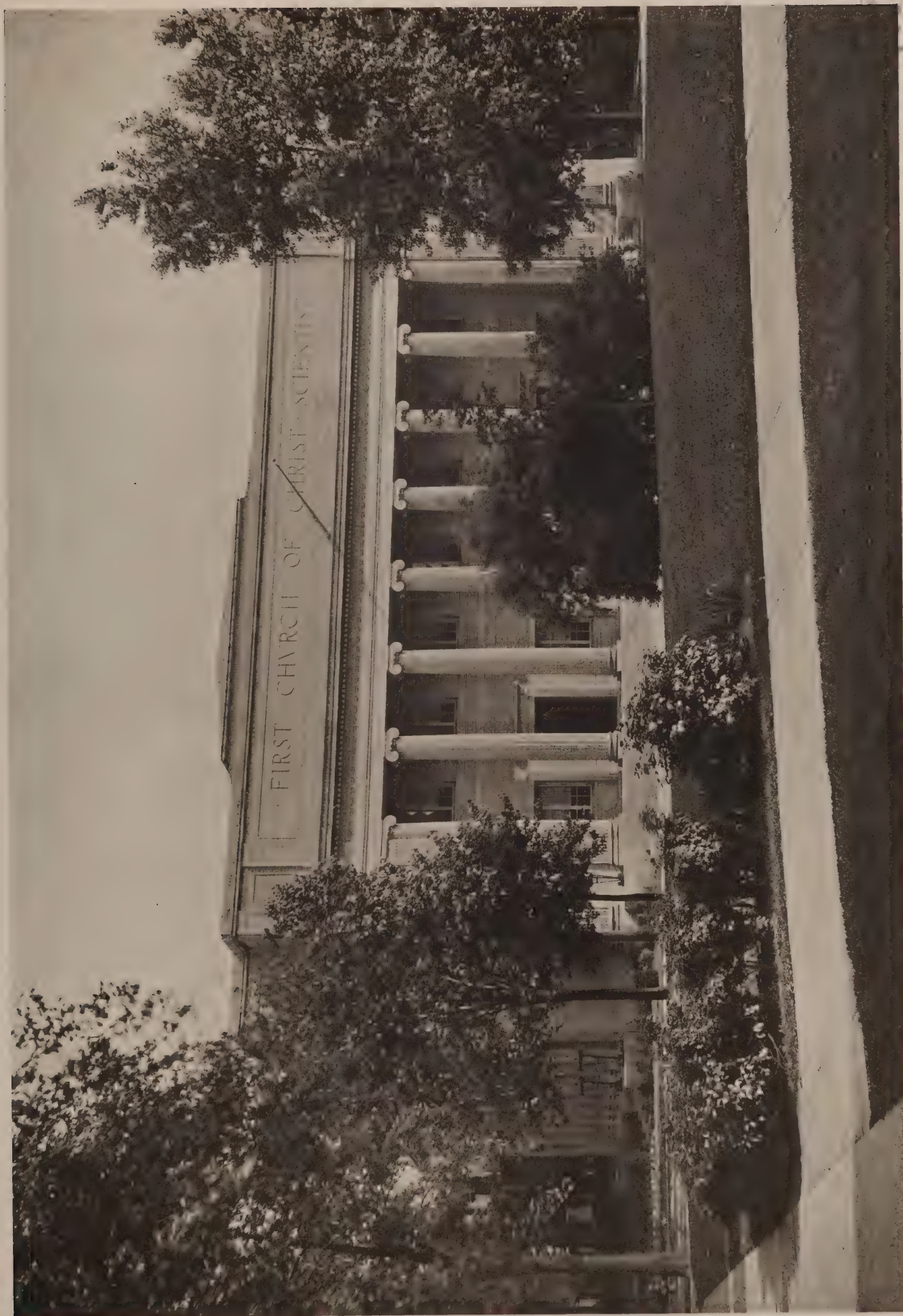
LONGITUDINAL SECTION ON MAIN AXIS

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GEORGE W. KELHAM, ARCHITECT







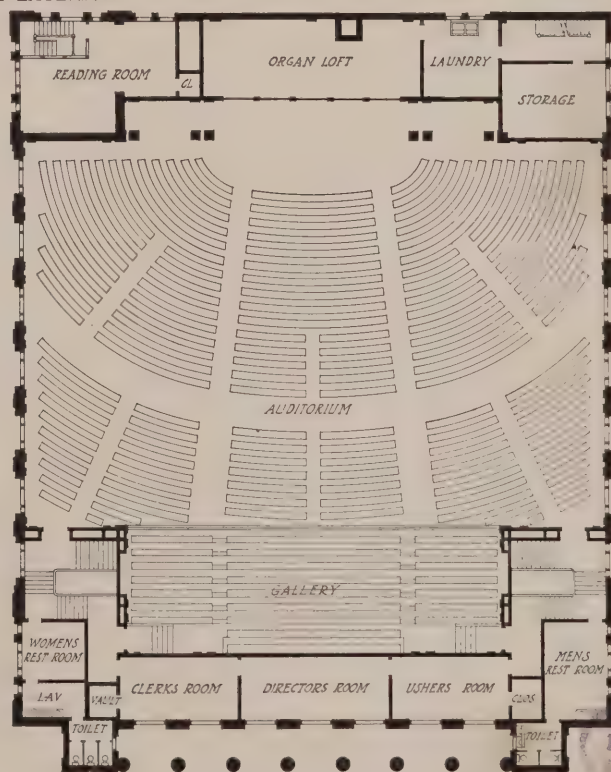
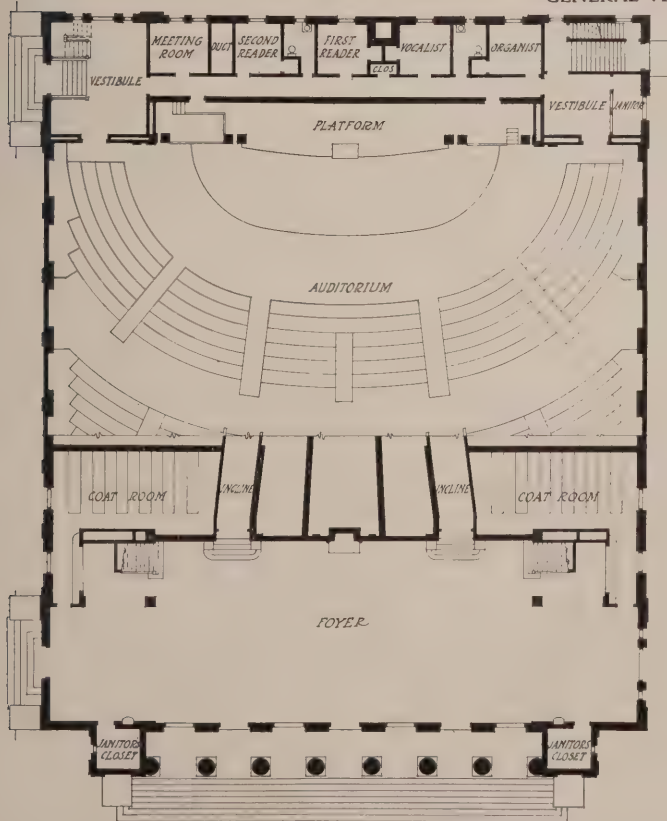
FIRST CHURCH OF CHRIST, SCIENTIST, DETROIT, MICH.  
SMITH, HINCHMAN & GRYLLS, ARCHITECTS







GENERAL VIEW OF EXTERIOR



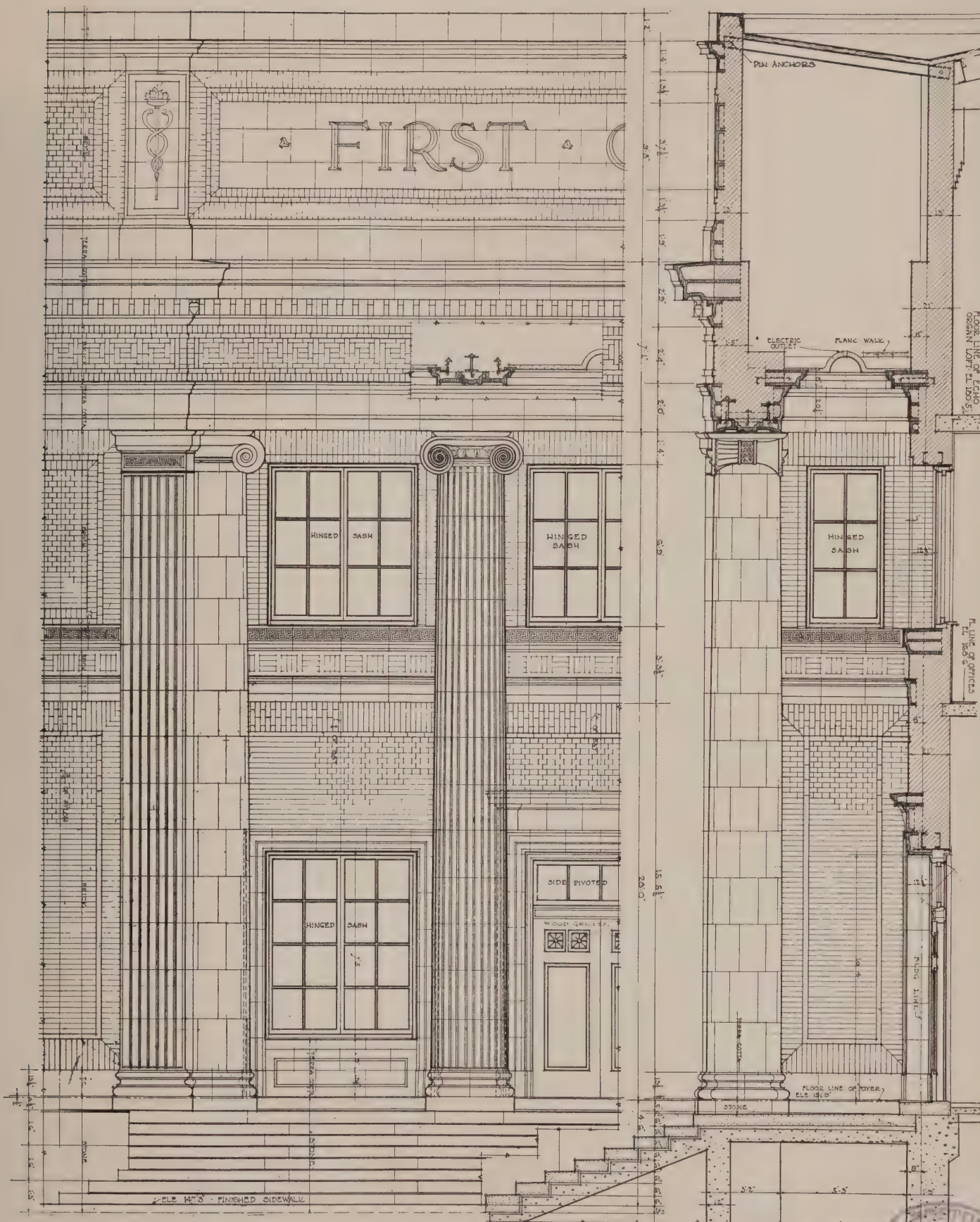
SECOND FLOOR PLAN

FIRST CHURCH OF CHRIST, SCIENTIST, DETROIT, MICH.

SMITH, HINCHMAN &amp; GRYLLS, ARCHITECTS







DETAIL OF MAIN FACADE

FIRST CHURCH OF CHRIST, SCIENTIST, DETROIT, MICH.  
SMITH, HINCHMAN & GRYLLS, ARCHITECTS







AUDITORIUM LOOKING TOWARD PLATFORM



AUDITORIUM LOOKING TOWARD GALLERY

FIRST CHURCH OF CHRIST, SCIENTIST, DETROIT, MICH.

SMITH, HINCHMAN & GRYLLS, ARCHITECTS







FREDERIC H. PEASE AUDITORIUM, MICHIGAN STATE NORMAL COLLEGE, YPSILANTI, MICH.

SMITH, HINCHMAN & GRYLLS, ARCHITECTS

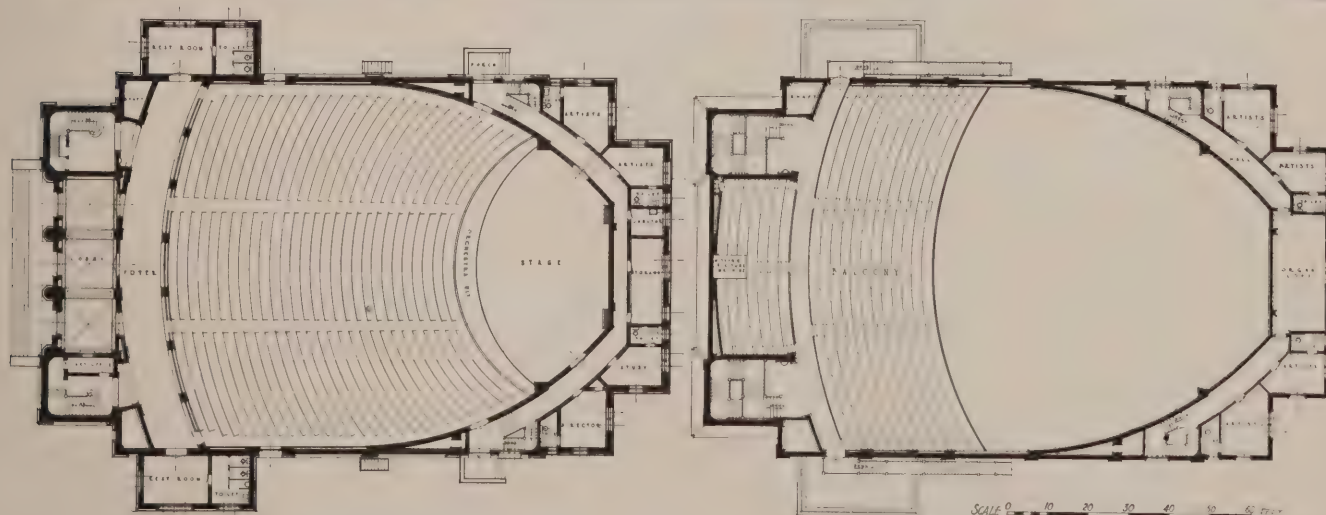








GENERAL VIEW OF EXTERIOR



FIRST FLOOR PLAN

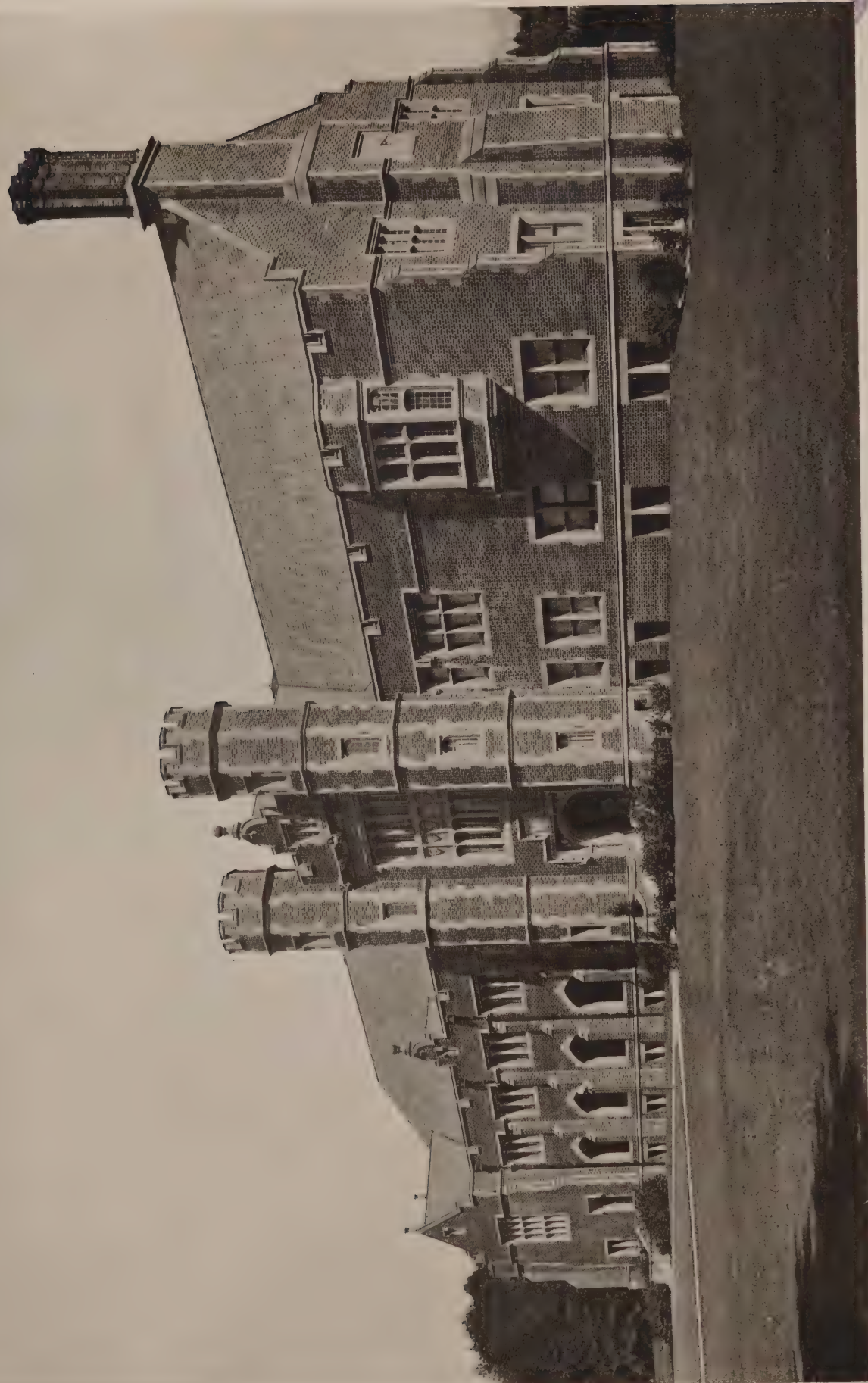
SECOND FLOOR PLAN

FRÉDERIC H. PEASE AUDITORIUM, MICHIGAN STATE NORMAL COLLEGE, YPSILANTI, MICH.

SMITH, HINCHMAN & GRYLLS, ARCHITECTS







STUDENT ALUMNAE HALL, MOUNT HOLYOKE COLLEGE, SOUTH HADLEY, MASS.  
WALTER F. PRICE, ARCHITECT







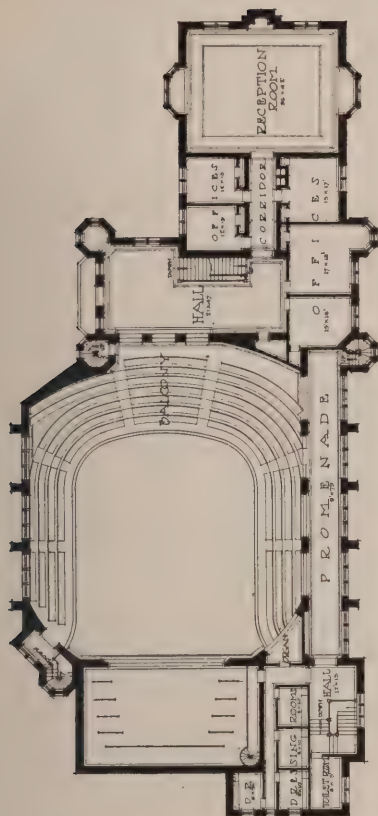
DETAIL OF MAIN FACADE

STUDENT ALUMNAE HALL, MOUNT HOLYOKE COLLEGE, SOUTH HADLEY, MASS.

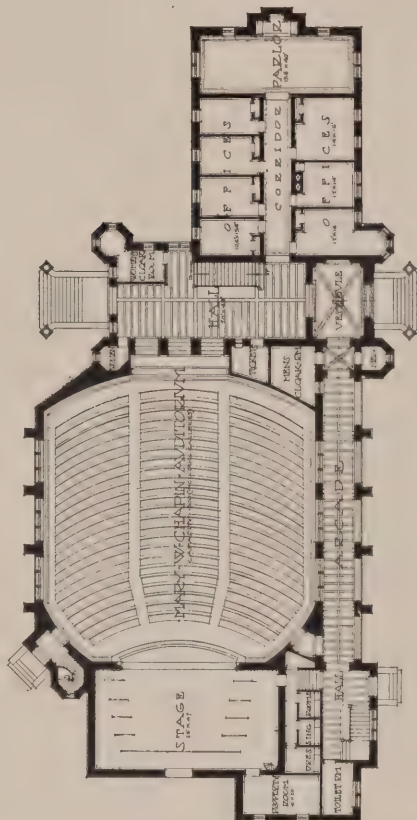
WALTER F. PRICE, ARCHITECT



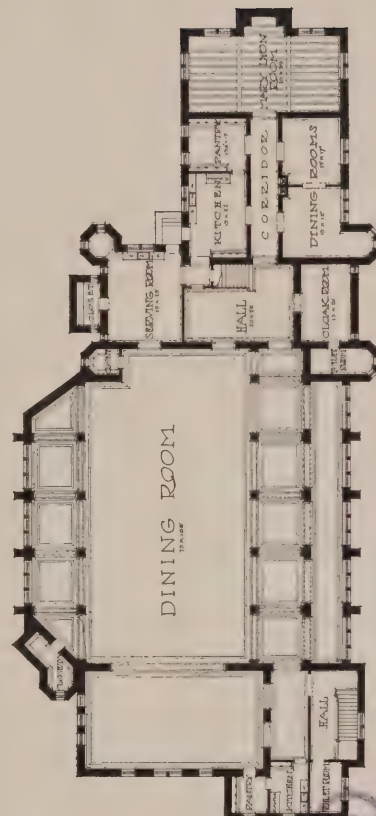




SECOND FLOOR PLAN



FIRST FLOOR PLAN



BASEMENT FLOOR PLAN



DETAIL OF REAR FACADE

STUDENT ALUMNAE HALL, MOUNT HOLYOKE COLLEGE, SOUTH HADLEY, MASS.

WALTER F. PRICE, ARCHITECT





## State Aid for Home Builders

A brief account of a Minnesota model housing campaign now permanently established as a great state service for those who, under ordinary conditions, would not employ an architect.

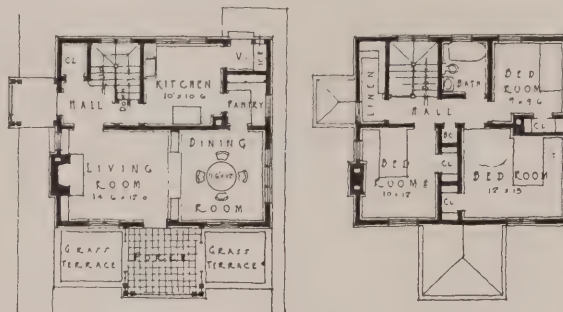
By MAURICE I. FLAGG

THE hard-headed farmer of the Northwest and the artist are two types of citizens who, at first thought, appear to have little in common. Their vocations seem incompatible. It is, indeed, difficult to picture the farmer and the artist walking arm in arm, singing the praises of each other's craft. It is still more unexpected to find farmers traveling two hundred miles or more from the far sections of a great Northwest state—Minnesota—to the capital city, St. Paul, eagerly searching for the office of an art commission to present many different problems in home building, and to ask help of a sort that has not heretofore been supplied by a State Government. If the plumbing balks, or the furnace fumes, it is not uncommon in the daily routine of the Minnesota State Art Commission to settle such difficulties for people living hundreds of miles from the Twin Cities.

This is exactly what is happening nearly every day in Minnesota, and by an art commission largely, because it has turned the tables and rather than preaching art in terms of pretty pictures, high lights, half-tones, and shadows, it is talking straight from the shoulder about wood, cement, heating, lighting, plumbing, and a hundred other requirements necessary in the building of a modern, model, artistic home.

This service, now maintained through what is known as "The Home Builder's Clinic," originally began as a campaign to supply the farmer a series of plans for model farm houses. It has since been elaborated to include model plans for city homes. Also model landscape designs for both farm and city conditions.

The Minnesota State Art Commission no longer hesitates to talk in terms of alfalfa, hogs, or hay if it wishes to impress upon the farmer the dollar-and-cents value of building a model farm house. It has worked out conclusive demonstrations to the effect that for the price of four hogs any farmer, by



Design for a Village House  
Sixth Prize, Mather & Burner, Architects

using a model farm-house plan, can increase the value of his real estate at least \$1,000.

The story of this new and radical service has many ramifications. It is long and somewhat detailed, so I shall try to set it down in a few paragraphs for readers of THE ARCHITECTURAL FORUM, who may be interested to know how an art commission executed a "right-about-face" and attacked the problem of art from an entirely different angle.

To begin with, let me point out that the Minnesota State Art Commission is a department of the State Government. It was created by an act of the legislature some thirteen years ago, and until

recently has received an annual appropriation from the State Government. This appropriation, for a number of years, was put into exhibitions of paintings, sculpture, and fine arts. The exhibits were shown in the cities throughout the state, and were transported from town to town in quite the same fashion as many of the agricultural trains are circulated through this vast territory.

But one day there came to the board of directors the idea that even an art commission might be able to serve two million five hundred thousand people in a more specific and effective manner than by showing them annually so much pigment and canvas. There are always a few people in each community who have more or less understanding about art, but the great mass of humanity has found little time for art education.

The Art Commission argued that every resident of the state should be given the privilege of art enjoyment and art understanding, but the problem of instruction was a difficult one and presented itself for solution through entirely different channels than had heretofore been attempted.

The commission reasoned that the home was the great and potential factor in the life of the Northwest; that people could be properly and easily reached in the interest of painting, sculpture, and a general

appreciation of the fine arts, if the home could be made the medium for such interpretation.

Now, Minnesota is a vast territory. Its chief asset is an agricultural one. It is beyond the pioneer stage, and yet people are living in homes that are not much beyond the frontier sort of cabin. The Art Commission set about its work and first made a census.

The director traveled the greater part of two summers, visiting every section of the state, many cities and towns — in fact, living under actual farm conditions. In this way he came in touch with the first-hand needs of not only the farmer and the farmer's wife, but people living in the smaller villages. A complete report along with statistics was compiled, and the commission set about upon its task.

It appealed directly to the Minnesota Chapter of the American Institute of Architects, which indorsed and stood by the idea of a campaign and competitions for a model Minnesota farm house. The manufacturers, the merchants, the bankers, the building material interests, all contributed funds to carry the plan to a state of completion.

An architectural competition was opened to the designers of Minnesota. Prizes were offered and awards made. A jury from beyond the state determined the merits of each plan. A number of plans were selected and approved and all became the property of the Art Commission with the understanding that those designers who did not receive an award would donate their plan as a contribution to this new and radical service.

This was the first time a public service of this character was placed upon such a basis, and through the channels of an art commission — a department of a State Government. It instantly removed any suspicion on the part of the public that it was a propaganda for private exploitation. The service was accepted with the same understanding as others sustained by the State Government.

The campaign was given generous publicity and

almost immediately there came a tremendous demand for the plans. In order to make the service self-sustaining, the commission asked the Minnesota farmer to pay \$3.50 for the working drawings and specifications, and those people living beyond the borders of the state were required to pay \$5.00. The commission has distributed plans in all sections of the world.

The State Art Commission undertook three other competitions. One for a model village house to be built of frame or stucco at a cost of \$3,000. Another competition projected plans for a model brick or hollow tile house to cost \$2,500, and then there came a landscape competition indorsed and supported by the Minnesota Chapter of the American Society of Landscape Architects.

The commission has not worked single handed in this enterprise. It has sought the indorsement and support of every institution that might lend character and quality to the service. The commission has, at all times, believed that such a service should be dignified and uphold the best that is available in the architectural profession. It particularly

desired to remove any aspect from the service which would class it with the "factory-made" plan and the "mail order knock-down" house.

To this end the Minnesota Chapter of the American Institute of Architects has served as godfather to the commission, giving it at all times counsel and advice freely. The Minnesota Chapter itself desired to establish some public service that might assist the small home builder to secure a better home and one of architectural merit. The Minnesota Chapter recognized, as does every other chapter, that the larger number of people do not employ an architect. These people are, for the most part, small home builders with a modest amount of money. They deserve some help, since each house that is built in any community either becomes an asset or a liability to the town and influences its future development.

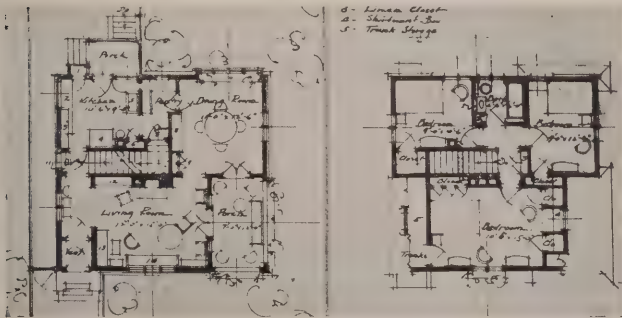
So it proved a happy sort of relationship that was



Two Views of Village House Built from Plans Supplied by Minnesota State Art Commission

First Prize, Lawrence Fournier, Architect





Design for a Village House  
Roy Childs Jones, Architect

cemented through these competitions, tying together, as it did, the architect, the manufacturer, the consumer, through a department of the State Government.

After the plans were distributed to the prospective home builders, there came many questions about materials, the cost, the adaptability, the quality, etc. People living in all sections of the state asked for additional information, many wanting color schemes designed for their homes, and others needed assistance in selecting the proper color of paint for the exterior. Others requested information about heating, plumbing, lighting, etc.

The State Art Commission almost instantly sprang into a service bureau or clearing house for home building information. It did not, however, attempt to answer all these inquiries itself. The commission called upon the Minnesota Chapter, and the Committee of Public Information agreed to supply unbiased, authentic information to those people who asked for assistance, and to do this practically free.

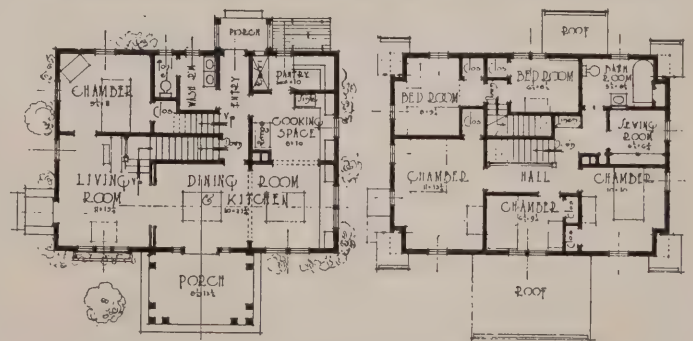
In a measure the commission had not anticipated this phase of the competitions. It had felt certain all along that the mere distribution of plans would answer the needs. Now, however, the commission is busy day by day not only supplying plans, but rendering direct service to hundreds, yes, thousands of home builders. It answers questions freely, it advises and sits in consultation, it gives honest judgment, and assists in many ways toward making a full and com-

plete diagnosis of each case which comes to its office. Hence the name of this new and radical service,—The Home Builder's Clinic.

It may be of interest to the readers of this publication to know that during the past twelve months the Art Commission has come in touch with about \$3,000,000 worth of small home building operations, and in nearly every case it has been able to render a service which might not otherwise have been available to these home builders, all of whom desired not only efficient, practical plans, but homes which would express some degree of beauty.

Let me set down a story which will illustrate the influence this service has exerted upon one community in Minnesota. This instance, particularly, is notable, and many more might be told if space permitted.

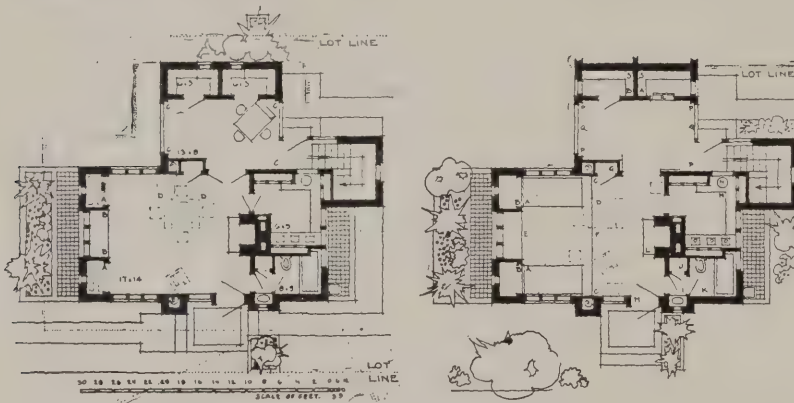
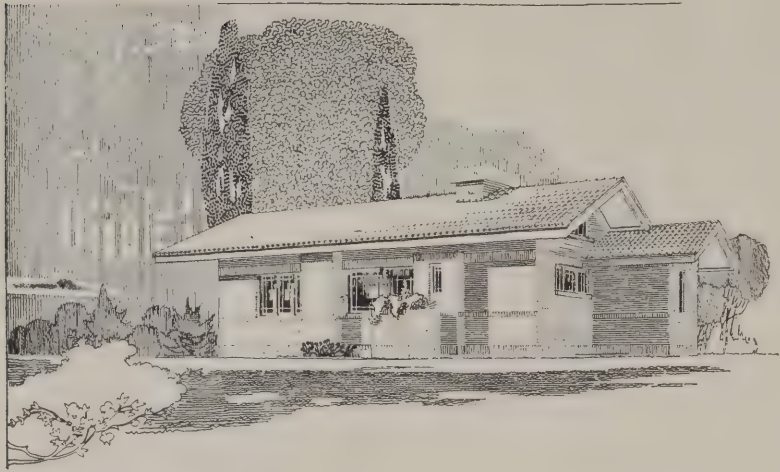
A gentleman living in the southern part of Minnesota applied to the Art Commission office for a model house plan. He was served with all the detail and information the commission had at hand. The little home was completed and the gentleman was very happy with the finished result. A few months later he came to the Twin Cities with a committee and



Minnesota Farm House Built from Plans Supplied by Minnesota  
State Art Commission

First Prize, Hewitt & Brown, Architects



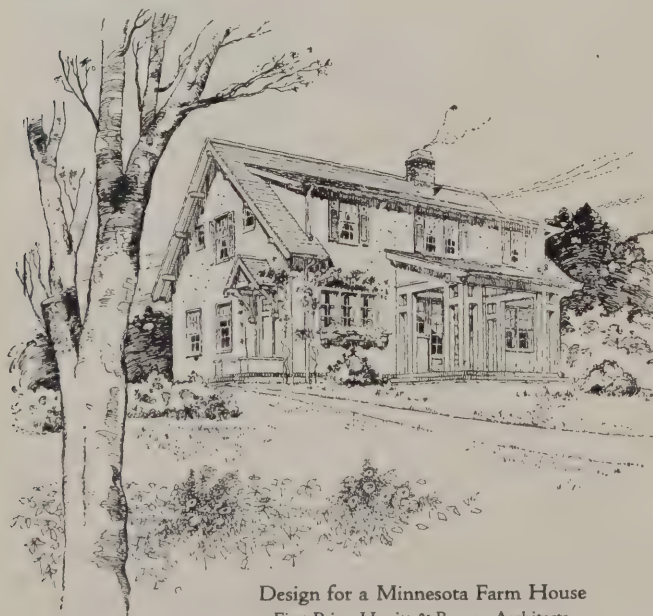


Floor plan showing arrangement for day uses at left and for night at right. Modern space-saving furniture is incorporated as a feature of the plan

Design for a Village House  
Purcell & Elmslie, Architects

asked for consultation and advice relating to a much larger municipal problem, which involved the expenditure of many thousands of dollars. The commission advised the committee to see an architect. It

*Note.*—The plans illustrated in this article are copyrighted and are reproduced with the permission of the Minnesota State Art Commission.—Editors.



Design for a Minnesota Farm House  
First Prize, Hewitt & Brown, Architects

explained that it was not in the business of preparing plans and that it was, furthermore, not interested in trespassing upon the field of the architect. This gentleman visited various architects in the Twin Cities and finally selected two men to undertake the problem: one an architect and the other a landscape architect. At the present time, in the town itself, there is being constructed a municipal building of architectural merit. Furthermore, the town is being planned for future expansion and according to the good judgment of a landscape designer.

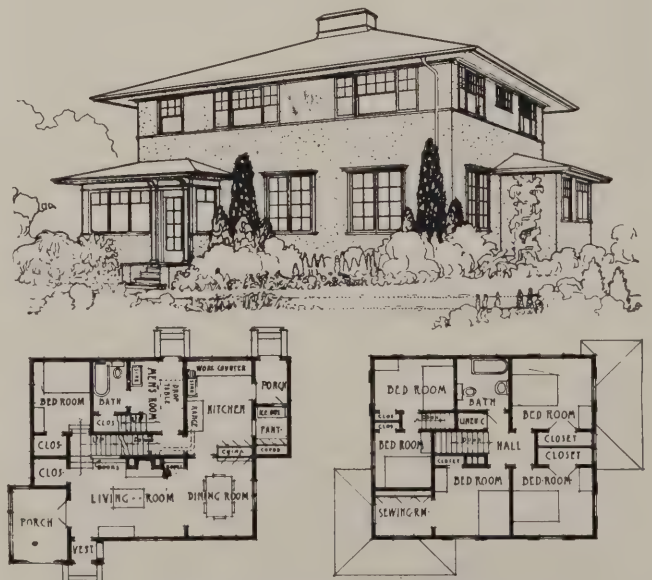
Thus in one instance has a Minnesota city been saved from what might have been a public monstrosity and haphazard development in the future.

Many large and potential problems come to the commission. It is enough, however, to point out that this service is exerting a powerful influence for better homes, better cities, better architecture, and city planning.

The commission has not abandoned its original purpose of fostering and promoting the so-called fine arts. It believes that paintings and sculpture are essential in the life of every Minnesota citizen. It does, however, concede that if art is to be a democratic possession, it must be made

a part of the life of every one, and the easiest, the most tangible, most practical way of teaching it to the greatest number of people is to assist in furnishing proper environment for their everyday livelihood.

The model house planning campaign has opened the way and the commission is no longer thought of as a "bit of embroidery on the petticoat of the state."



Design for a Minnesota Farm House  
Second Prize, Joseph McCoy, Architect



THE FORUM COLLECTION OF  
EARLY AMERICAN ARCHITECTURAL DETAILS

PLATE FORTY-FIVE



*THIS house was built by Capt. Archibald Macphedris between the years 1712 and 1715, at a cost of £6,000. It is the oldest brick building in Portsmouth and built of bricks from Holland. The doorway indicates the transition from*

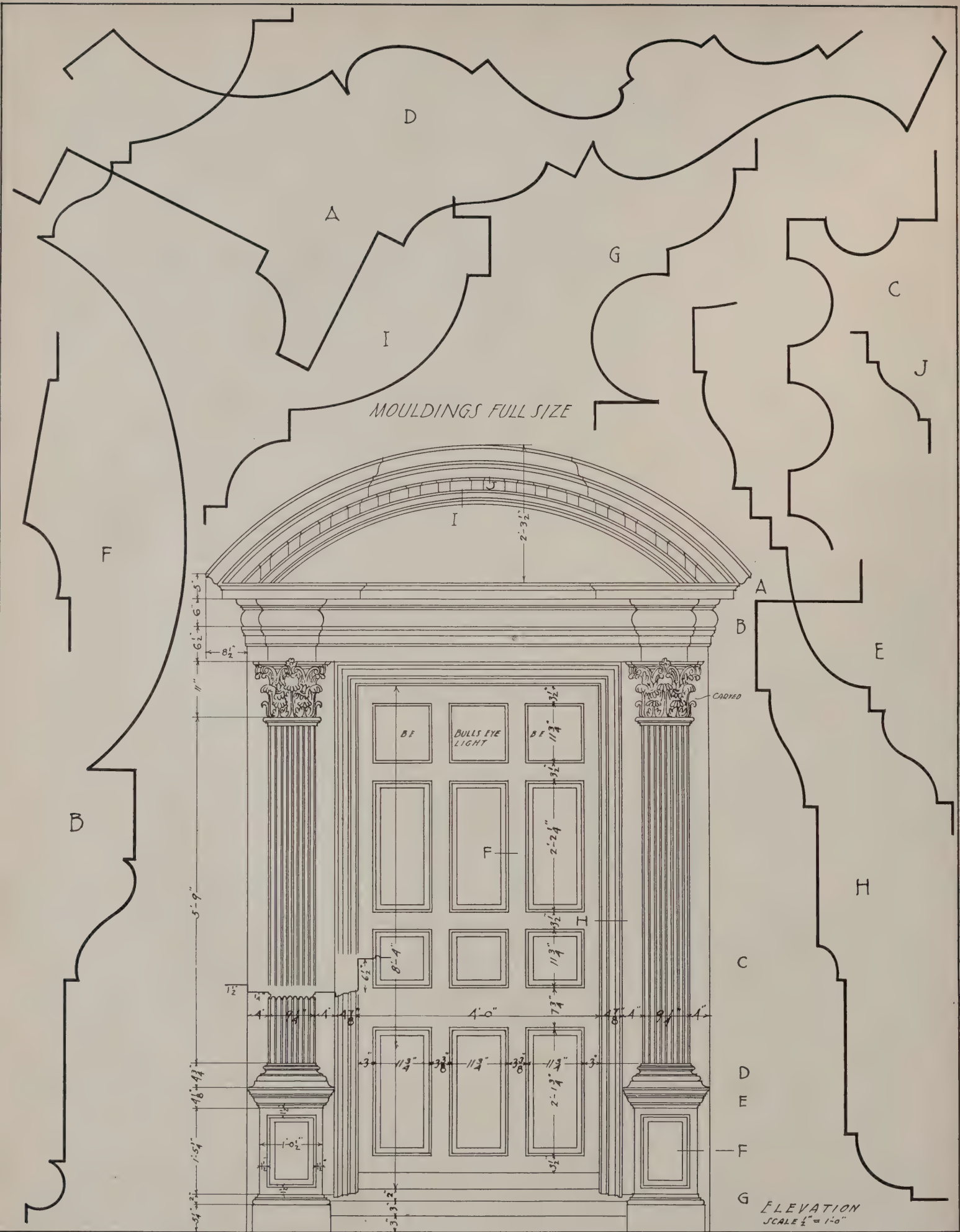
*Jacobean to Georgian taste. In composition and in the detail of the door the style is Jacobean, but the mouldings and other details have the character of early Georgian. The work is in a good state of preservation.*

DOORWAY, WARNER HOUSE, PORTSMOUTH, N. H.

Built about 1712

MEASURED DRAWING ON FOLLOWING PAGE







## Architects and the Camouflage Service

EDITOR, ARCHITECTURAL FORUM:

In reply to your letter asking just where architects "come in" on camouflage work, I am glad to inform you as far as I am permitted.

It is said that the English have made but little use of their architects, or rather have found but few places in which their training would be of benefit; but the United States has seemed to realize that the training required for the architectural profession fits its members for very many military purposes, and for some in a very high degree.

Among the branches of military service, camouflage has become conspicuous out of all proportion to the number of men engaged in it, although perhaps not out of proportion to its usefulness, and among the professions and trades which are conspicuously successful in producing the type of men who become good camoufleurs is the profession of architecture. This is for two reasons: first, the profession brings forth the ability to visualize results, and to make drawings or sketches which will enable others to produce these results; second, architects with any extended practice have learned to handle men, not only draftsmen, but mechanics and laborers. This latter qualification is of nearly as much importance as the first, since, contrary to the generally accepted idea of camouflage work, it does not consist chiefly of panoramic landscape painting, but in the preparation of large surfaces which in texture and color resemble, or mimic, natural objects, and which must be made and set up by squads of men and not by individuals.

The average artist painter — I qualify painter, for there are four varieties officially recognized as desirable for camouflage, — artist, house, sign, and scene painters — has not had much experience in handling men, and does not always exhibit the combination of tact and firmness necessary to successful military discipline — a very necessary requirement in the service. On the other hand there are few architects who have the knowledge of color components and values necessary to simulate successfully natural colors and objects, and it is from the painters that the most useful information as to how to go about the preparation and coloration of camouflage has been learned, and some among them have shown extraordinary quickness in grasping military affairs.

Perhaps I may digress to explain why the camouflage work is being done by men trained and equipped as soldiers, since the idea seems to be widespread that camouflage could be just as well done by artists and landscape men without the fuss and lost time involved in running a military organization. In the first place, it is essential that all men sent abroad should be absolutely under control. It must be obvious that a civilian, perhaps a volunteer, could not be picked out of bed at three o'clock in the morning and ordered

to do something. He might reply that office hours were from 8 A.M. to 5 P.M., and the only thing to do would be to discharge him. But one doesn't want to discharge men who have been trained for particular and indispensable duties and who have been transported abroad at considerable expense. Also military training does do one thing that even the best managed civilian organization cannot do: it inculcates in employees, so to speak, the habit of doing what they are told to do instantly and regardless of circumstances. The civilian will run away from shell fire which the disciplined man, no braver to begin with, scarcely notices — one man is his own master, the other has no independent volition.

It may also be interesting to you to know why the army is strict about living up to the physical requirements as to eyesight, weight, age, etc. It ought to be, but does not appear to be, perfectly obvious that the man who is dependent upon glasses for his usefulness is worthless if they are broken. The army at times cannot afford to lose a man's services for a day while a new pair is being fitted, even if a new pair can be obtained at all. The question of weight is a little more difficult to make clear, but as each man has to carry from sixty to sixty-five pounds on his own feet, it is necessary that he should be as strong as the average, and it has been found that the thin man tires more quickly than those whose weight is about two pounds to the inch of height. Of course, fat men tire quickly, too, but there are no fat men in the army very long, nor are they discharged — they get thin and hard.

Quite a number of people seem to think the camouflage service offers a safe and easy army berth, and we have had a number of applications based on this understanding. As a matter of fact, it is as arduous as any, and as dangerous as any, except the machine gun service; but for the most part the men who have written that they wanted to enlist have done so because they honestly felt that they could be of service, and among these have been a great many architects and architectural draftsmen. I cannot tell you how fine they have been. I have always been proud of my profession, but never more so than to-day when I have had an opportunity to see not only how many have been willing to come, but how they have made good. Most of them are young men of the type which are head draftsmen and superintendents in the big offices, and many of them will no doubt be commissioned before this war is over.

I think a great compliment was paid to the profession when Major Evarts Tracy (of Tracy & Swartwout) was selected to begin organization. He was assumed to have, and has, excellent judgment of men, and extensive acquaintance among the men

fitted to be camoufleurs. He has certainly selected a wonderful lot of men. Among the first officers selected were 1st Lieut. Laurance Hitt of New York, an architect who had been driving an ambulance abroad and had been decorated by the French Government for gallantry, and 1st Lieut. André Smith, who is as well known for his etchings as for his architecture. Since Major Tracy left, I have been honored by being given charge of the training, equipment, and personnel of camouflage troops.

One company only has been authorized up to the present time, though more will doubtless be authorized at an early date, perhaps within a couple of weeks. A number of the best men in this company are architects or architectural draftsmen, men like Burnham Hoyt, B. G. Goodhue's head draftsman, Austin Whittlesey, also from Goodhue's, who was Le Brun scholar last year, and W. D. Foster, head draftsman in H. Van Buren Magonigle's office. Other New York men are Van Horne D. Wolfe, of Walker & Gillette's office, Thomas I. Raguere, Ralph T. Walker, of Goodhue's, S. N. Hartell, who conducted his own office in the Architect's Building, Bruce Rabenold, of W. W. Bosworth's office, Prentice Sanger, Nelson Spalding, who gave up his office to enlist, Greville Rickard, of Cass Gilbert's office, and Ralph E. Griswold, a landscape architect in New York. David C. Comstock left a professorship in Cornell and has done splendidly as a soldier, Charles F. Brunckhorst came from Schmidt, Garden & Martin's office in Chicago, Nelson Voorhees was a University of Michigan man. Alexander MacLean, Oliver Larson of Minneapolis, Reah de Bourg Robinson from Wilmington, and Abraham Rattner, one of the cleverest colorists in the first company, are others among the architects and draftsmen.†

As a considerable amount of transplanting of trees and shrubbery is necessary some landscape architects were included in the personnel list, most of them young men, but of excellent professional standing or of good practical experience. Ralph E. Griswold is a Cornell graduate and has been practising in New York, Thomas E. Seyster is a Princeton man who has come from Chicago, Robert A. Clifford has been in charge of the decorations of several big New York hotels and did the planting of the Far East Gardens in the Vanderbilt, the Japanese Gardens at the Ritz, and also work at Newport.

Most of the men in the company are of the type of those who have been mentioned by name, not yet distinguished as practising architects, but of great skill and possessed of youth, experience, and training, and thus far none has proved more fertile in invention, more apt in military affairs, or persevering in devotion to training than the architect.

It is perhaps unnecessary for me to say how pleasant it is to be able to tell you about these men in our profession who have already joined, and I am

enclosing a list of them, but there are in addition to these men a good many who have enlisted but are not actually joined to the company, but are held at recruiting depots until a place can be found for them. I want to say also that any architects or architectural draftsmen of experience who are interested in the work will be welcome as soon as there is a place to use them, and I may be reached either by mail or personally at the Office of the Chief of Engineers, State, War, and Navy Building, Washington, D. C.

Thank you for your interest in this company.

Yours very truly,

AYMAR EMBURY II.

*Capt., Corps of Engineers, U. S. R.*

#### List of Architects in First Camouflage Company :

|                        |                        |
|------------------------|------------------------|
| Charles F. Brunckhorst | Burnham Hoyt           |
| David C. Comstock      | Everit A. Herter       |
| W. D. Foster           | Alexander MacLean      |
| Roy C. Jones           | Thomas I. Raguere      |
| Oliver Larson          | Reah de Bourg Robinson |
| Louis F. Voorhees      | Van Horne D. Wolfe     |
| Austin Whittlesey      | Ralph T. Walker        |
| Fred R. Lorenz         | Robert A. Clifford     |
| James R. Wilson        | Walter C. Clifford     |
| Cromwell H. Case       | Ralph E. Griswold      |
| Clifford C. Jones      | S. N. Hartell          |
| John H. Eastman        | Bruce Rabenold         |
| Abraham Rattner        | Greville Rickard       |
| Thomas E. Seyster      | Prentice Sanger        |
| V. P. Spalding         | Sheldon Viele          |
| G. F. Axt              | G. Dexter              |

#### CURRENT NOTES

Charles C. Zantzinger, of the architectural firm of Zantzinger, Borie & Medary, Philadelphia, has entered the diplomatic service and will be attached to the Legation at Stockholm.

The annual convention of the American Institute of Architects which, under normal conditions, would have been held in Washington during December, has been indefinitely postponed. The Government has made it known that conventions in Washington during the war will not be favored.

President Wilson has appointed John Russell Pope a member of the National Commission of Fine Arts.

#### COMPETITION FOR SUBURBAN HOUSE

A competition for a house to cost \$6,000 is announced in connection with the Real Estate and Building Show to be held at Columbus, Ohio, in January, 1918. Five hundred dollars are offered in prizes. Drawings must be submitted by Dec. 26, 1917. For further details, address Real Estate and Building Show, Arcade Building, Columbus, Ohio.



## EDITORIAL COMMENT

TO-DAY it is Major Starrell, Captain Marbury, and Lieutenant Andre. Yesterday it was Bob Starrell, Jack Marbury, and Dick Andre. 'Tis this change in the manner of greeting one's old friends and acquaintances that impresses us most, perhaps, with the fact that a condition of war has supplanted a condition of peace in our country. Will the service to mankind that will be rendered by those of our friends who have donned the garb of Army and Navy be greater than that given by them as private citizens in times of peace? Is it all a penalty that has been imposed on modern civilization because of its weaknesses that should have been overcome? Or is it only the next and preordained step in the evolution of those conditions that shape the destiny of man? Is the world going to be better for the sacrifices that will be made in this war? Was it necessary to visit this scourge on the civilized peoples of the world that they may be purged of their sins? Is it all a step forward or back? — We wonder.

Whatever the answer, whatever the final outcome, America is throwing its best efforts into the struggle and no group of Americans has responded more readily to the nation's call than the architects. A visit to Washington and meeting there with men who have been drawn to the service from the architectural profession will establish beyond question the fact that all, without exception, have pledged themselves purely for patriotic reasons to the work that must be done, and in nearly all instances at great personal sacrifice.

In the division having to do with the housing of aerial activities, we find Robert C. Dunbar — from the office of Charles A. Platt — in charge. At present Mr. Dunbar, soon to receive an Army Commission, is engaged in recruiting men who because of their training are capable of directing the work of construction. Many young architects from various parts of the country are already enrolled in this branch of the service. The work of designing and planning the buildings has been done by Albert Kahn of Detroit.

Captain Aymar Embury II is at present in charge of the work which has to do with camouflage. Major Evarts Tracy, who formerly had charge of this work, is now in France in charge of a company of camoufleurs. In this division one also meets many men whose names are well known in the architectural profession.

Major William A. Starrett, of Starrett & Van Vleck, is chairman of the Emergency Construction Committee of the War Industries Board. Major Francis B. Wheaton for the Quartermaster's Department — a member of the Institute — has charge of the buildings that have been, or are being, erected at the several big National Army cantonments.

A great deal of the temporary hospital work is being carried on by the Surgeon General's Department, although the base hospitals in France for our Government are being built under the direction of Charles Butler of New York and Edward F. Stevens of Boston, associated.

The four buildings in Washington that house the Food Commission, Coal Commission, the Council of National Defense, and Ordnance Department were designed and built under the direction of Waddy B. Wood. In the creation of these buildings the full measure of the architect's ability is shown. In the rapidity of their construction, and the completeness with which they meet every need, there is a sharp contrast with other buildings, erected under the direction of engineers rather than architects.

With no thought of indulging in invidious comparison, the very natural question arises as to the part architects have been called upon to take in governmental construction work. Frankly, it must be allowed that up to the present time a great deal that has been done could have been carried on better had it been under the direction of skilled men in the architectural profession. This is not meant in criticism of those who have had direction of the work, but is submitted rather as a constructive thought. One cannot visit Washington and meet men charged with the creation and maintenance of a great American army without being impressed with the marvelous ability and sincerity, honesty of intention, and fixed determination on the part of those men to do everything in the best manner possible under existing conditions. It is an inspiration to come in contact with these men and their works, for we are speaking not of statesmen and politicians, but of the real captains who have been called upon to direct these great undertakings.

Notwithstanding, we repeat, that up to now the genius of the architect has not been employed as liberally as it should have been. That it will find larger employment is almost certain, for there is absolutely no disposition to hinder or sidetrack those who are capable of efficient service in any line of work. There can be no question concerning the desirability of employing architects' services more liberally in all types of buildings that must house our war activities. It is a legitimate function of the profession to organize its efforts and make it better known that the service of the architect is indispensable if government building is to approximate the maximum of efficiency. It is well within the rights of the profession to seize upon the opportunity at hand and make its power felt in larger measure in a field that may be rightly claimed as its own. To stand apart from this work, expectantly, is a mistake; to go to it is a duty.

A committee, composed entirely of architects, has already been chosen to investigate and report on the question of "how much more can the services of the architect be employed in war time building construction?" At least two other committees, composed in part of architects, are engaged in a study of housing problems to the end that, very likely through government aid, many of the larger plants engaged in the manufacture of war supplies will be able to provide homes for their employees, not of a make-shift order, but of a type that is in keeping with the genius, the virility, and high purpose of those sincere and capable men at Washington and elsewhere who have laid their hands to the plow.

THE Board of Examiners and Registration of Architects for the State of New York has recently made its second annual report. The act creating this board became a law on April 28, 1915, and was reenacted May 4, 1917, with amendments affecting the name of the board and term of office of the members, extending the time for registration without examination, and making certain minor changes. The board was appointed by the Regents and held its first meeting Oct. 22, 1915.

The report is of interest to all architects in showing the effect that the regulations imposed by the Registration Law are exerting upon the practice of architecture.

The applications received during the two years since the law went into effect total 1,991; of these 175 were withdrawn; 1,367 have been approved; 358 have been disapproved with the recommendation that they be not given certificates without examination, and 89 remain to be given final consideration. No examinations have been held for the admittance of new practitioners. Only two applications as yet have been received for registration upon examination.

During the year 350 applications for registration have been approved, making the total registration on Sept. 13, 1917, 1,367. Applicants appearing before the board during the past year for personal hearings number 108, most of them in appeal from previous disapproval of their applications and some upon request of the board to present proofs of qualifications. Of these appeals, 18 were granted. The board examined several hundred sets of drawings and specifications submitted at its request by applicants as evidence of competency.

After two years' experience with the operation of the law, and after examining the work of scores and hundreds of men who have not sufficient technical knowledge to practise the profession of architecture creditably, the board states that it is confirmed in its belief that the most important function of the Registration Law is its tendency to raise the standard of education and technical qualifications. The law does

not prevent engineers and others from engaging in building work, but it does forbid any new practitioner assuming the title "architect" until permission is granted for reasons which in effect make "architect" a degree and the certificate a diploma of achievement. The law does not in any way compel the public to patronize architects, except as it may command respect by fixing high standards of ability and qualifications for those permitted to use the title. The operation of the law has made evident the strong impulse felt toward higher education on the part of young men ambitious to practise, and with the assistance of co-operating architectural schools the board has confidence that the law will justify its beneficent purpose.

Fourteen states of the Union have passed laws regulating the practice of architecture. It is strongly to be hoped that as other states enact similar legislation, all influence will tend toward a common standard which will permit reciprocation or affiliation between the various states.

### BOOK NOTES

ITALIAN FURNITURE AND INTERIORS. 200 plates. 11 by 14 inches. Text by George Leland Hunter. Issued in 10 parts of 20 plates each in paper portfolios. Price \$30 — \$3 per part as published. New York, William Helburn, Inc. The growing regard for furniture of the Italian Renaissance period for the furnishing of residences is an encouraging evidence of the interest the layman is taking in the simple principles underlying good art. For direct simplicity of composition and pleasing decorative forms there are no better examples than the sturdy Italian chests, tables, and chairs of the fifteenth century. Following the lead of a few American architects who were keen to see the adaptability of Italian furniture to modern uses and taste, there has gradually come about a wide demand for Umbrian motives. Compact and easily obtained data on the subject, however, have been meager, being limited to scattered collections of museum pieces. Enthusiastic students of the style, and many of those who are not yet its adherents, will therefore find much interest and value in the present collection of examples selected from such treasures as Villa Palmieri, Palazzo Davanzati, Florence National Museum, Cluny Museum, South Kensington, and Metropolitan Museums.

The plates are large and well printed on heavy paper. The furniture is shown in detail and the location of the original is given. In addition to the plates of furniture there are a number of interiors from Italian palaces and public buildings showing the furniture in the architectural setting of the period. These plates, aside from the information they hold for the furniture designer, are of large architectural value in showing the character of the interiors in the days of the Renaissance.





Jameson Roofing Company, Roofing Contractors

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It has plants in various parts of the country, and to-day is turning out dyes equal in every way to those formerly produced in Germany.

Its most important plant is the Schoellkopf Works located at Buffalo, N. Y., illustrated herewith.

This plant was designed and constructed by The John W. Cowper Company, one of the largest firms of engineers in this country, and it represents the very best in building construction.

Quite naturally Barrett Specification Roofs were chosen to cover the various buildings in preference to any other type because the experience of many years has demonstrated that these roofs

have a longer life than any other and cost less per year of service. The reasons for their long life are:

*First,*

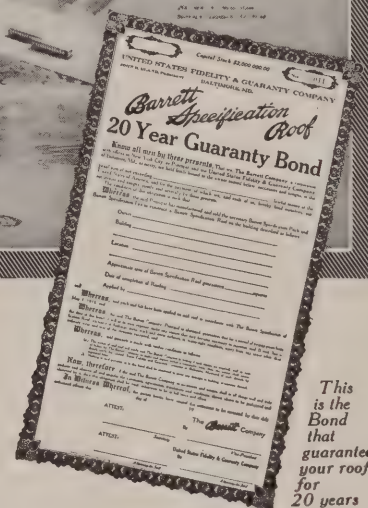
because they are constructed of Barrett Specification Pitch and Felt, the greatest waterproofing materials known.

*Second,*

because a greater amount of waterproofing is used in Barrett Specification Roofs than in any other kind of roof-covering, and the amount of waterproofing material in the roof largely determines its life.

*Third,*

because under the 20-Year Guaranty Plan the roofs must be constructed under the supervision of our inspectors, and we know, therefore, that they will be constructed right.



In view of all this, do you wonder that Barrett Specification Roofs are more popular than any other type for use on permanent buildings of all kinds?

### The 20-Year Guaranty Bond

We are now prepared to give a 20-Year Surety Bond on all Barrett Specification Roofs of fifty squares and over, in all towns in the United States and Canada with a population of 25,000 and over, and in smaller places where our Inspection Service is available.

Our only requirements are that The Barrett Specification dated May 1, 1916, shall be strictly followed and that the roofing contractor shall be approved by us.

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This is an actual photograph of a cross-section of the Barrett Specification Roof on the above plant. Note the five alternating layers of Specification Pitch and Felt Waterproofing, and the heavy wearing-surface.



# TARGET AND ARROW ROOFING TIN



Stable and Garage of a large country estate near Baltimore, Md.

Roofed with 20,000 square feet of TARGET AND ARROW tin, by Jno. G. Hetzell & Son, roofers, Baltimore.

The roofing is applied with standing seams, giving a ribbed effect, and is painted a light gray color.

Do not overlook the possibilities of attractive color effects in using tin roofing. In the past, tin roofing was seldom thought of as having any artistic merit. Nowadays standing seam or heavy ribbed types of tin roofing, — either with large or small ribs, rounded or square — colored to harmonize with the general color scheme of the building, give a roof of character and distinction for any class of building.

The first coat of paint for a tin roof should be one of the kinds approved by the National Association of Sheet Metal Contractors, *i.e.*, metallic brown, Venetian red, red oxide or red lead, with pure linseed oil and very little, if any, dryer. Over this first coat any color can be applied,

for instance, a gray lead color, to simulate the weather-beaten appearance of the lead roofs of old English cathedrals; a light green to give the appearance of old copper, or a nut brown color for a remarkably rich effect. For a red brick building, try dull green or soft gray. Even if the entire roof of the building is of some other material, such as slate, tile, etc., the tin flashings, open valleys, etc., should be painted to harmonize in color with the rest of the roof.

A good tin roof deserves a coat of paint every four or five years to repair the ordinary wear and tear of the weather, and to keep it in perfect condition. This repainting also affords an opportunity to freshen up the color.

A list of color suggestions is given on "Service Sheet," No. 4, Index No. 18, issued by the Architectural Service Corporation of Philadelphia.

Description of this product will be found in Sweet's Architectural Catalog — all editions.

**N. & G. TAYLOR CO., Philadelphia**

*Headquarters for Good  
Roofing Tin since 1810*





**Property Loss by Fire  
in the United States**

|      |   |   |               |
|------|---|---|---------------|
| 1910 | - | - | \$214,003,300 |
| 1911 | - | - | 217,004,575   |
| 1912 | - | - | 206,438,900   |
| 1913 | - | - | 203,408,250   |
| 1914 | - | - | 221,439,350   |
| 1915 | - | - | 172,033,200   |
| 1916 | - | - | 213,539,670   |

***Saving towns from fire  
that wipes them off the earth!***

**A** GAIN and again it happens—we see a little village busily growing into townhood. We see the town prosper into a thriving young city—its buildings becoming more and more congested—and then, the scourge of fire strikes and in one awful night, or in a few hours, that community of progress disappears, leaving nothing behind but a blackened scar and a heritage of loss and distress.

The death rate of America's fire-gutted towns has awakened thought. The lessons of Baltimore, Salem, Paris, Atlanta, are bearing fruit. The country is looking for reasons why, each year, fire should cost it millions of dollars. And it is finding one of the biggest reasons in the inflammable roof.

There is a roofing that repels fire, checks its spread—confines it to its particular locality. It is made of Johns-Manville Asbestos—a material that satisfies every roofing requirement and in addition adds safety against fire.

Every building in America can have a Johns-Manville Asbestos roof—because there is a style of roofing for each style of roof, for each style of building, whether it be a wooden silo or marble museum. Johns-Manville, with its complete line of roofings, is contributing to public safety. And as the Asbestos roof continues to gain in acceptance so will safety against fire move toward the ideal.

Johns-Manville Asbestos Roofings: Asbestos Built-Up Roofing; Asbestos Ready Roofing; Corrugated Asbestos Roofing; Transite Asbestos Shingles. Other Johns-Manville Products that contribute to safety against fire: Fire Extinguisher; Asbestos Theatre Curtains; Fuses; Moving Picture Machine Booths; Asbestos Fireproof Wood.

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10 Factories—Branches in 54 Large Cities

**JOHNS-MANVILLE**  
Service in Fire Prevention

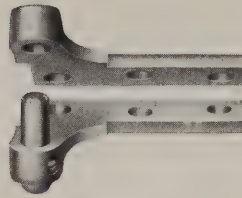
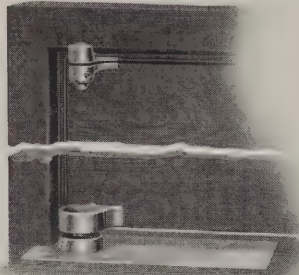
COVERS THE CONTINENT



# **RUSSWIN** CHECKING FLOOR HINGES

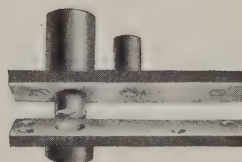
**RUSSWIN**  
**RUSSELL & ERWIN MFG. CO.**  
NEW BRITAIN CONN.  
NEW YORK - SAN FRANCISCO - CHICAGO - LONDON

FOR  
SINGLE AND DOUBLE  
ACTING DOORS



*Rim Pivot*

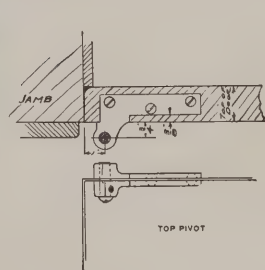
*Single Acting Hinge No. 13, Applied*



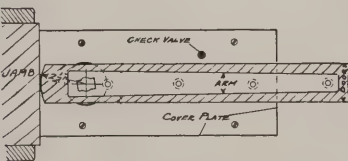
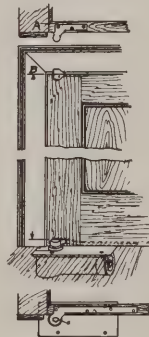
*Mortise Pivot*

*Double Acting Hinge Applied*

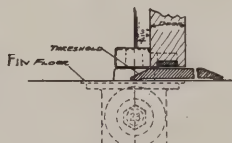
## **DETAILS FOR APPLICATION, HINGE No. 13**



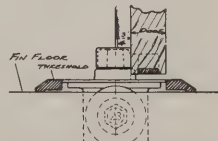
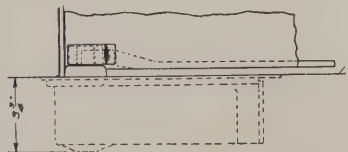
TOP PIVOT



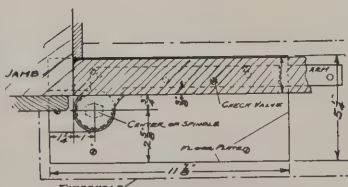
AS APPLIED CENTRALLY ON JAMB WITH ARM IN CENTER OF DOOR



AS APPLIED UNDER THRESHOLD FLUSH WITH FLOOR

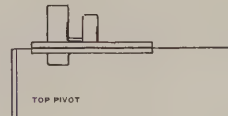


AS APPLIED FLUSH WITH TOP OF THRESHOLD

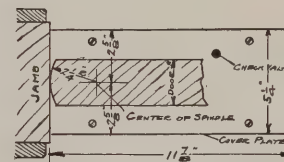
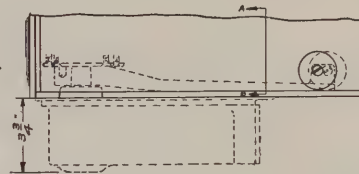
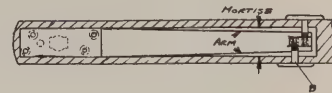


AS APPLIED WITHOUT THRESHOLD FLUSH WITH FLOOR

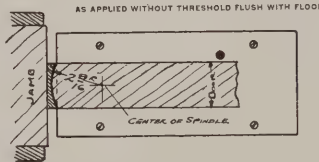
## **DETAILS FOR APPLICATION, HINGE No. 23**



TOP PIVOT

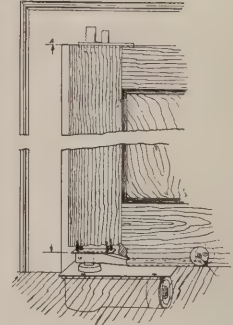


APPLICATION TO JAMB WITHOUT HANGING STRIP



AS APPLIED WITHOUT THRESHOLD FLUSH WITH FLOOR

APPLICATION TO JAMB WITH HANGING STRIP



AS APPLIED FLUSH WITH TOP OF THRESHOLD



AS APPLIED UNDER THRESHOLD FLUSH WITH FLOOR

## **RUSSWIN** CHECKING FLOOR HINGES

### **HEAVY MODELS. BALL-BEARING**

Single Acting. Without Side Plates, No. 13

Double Acting. Without Side Plates, No. 23. - With side plates, No. 123.

These hinges are suitable for Heavy Entrance or Vestibule Doors, not exceeding 3 feet in width. Single acting hinges can be applied flush with floor, or threshold, or under the threshold and hung flush with casing or in the center of the jamb. For hinges to be applied in center of jamb specify No. 13 CT; for application under the threshold specify No. 13 T.

Double acting hinges can be applied flush with floor, or threshold, or under the threshold, centered on the jamb. For hinges to be applied under threshold specify No. 23 T or 123 T. Size of case: Length, 11 7/8; width, 5 1/4; height, 3 3/4. Specify Mand of Door on single acting hinges.





## The Normal School at San Diego

W. S. HEBBARD, Architect

Has Corbin hardware throughout of a quality that will stand rough usage without impairing either the appearance or the service. More Corbin hardware is used in the best school-houses on the coast than of any other manufacture.

### P. & F. CORBIN

Division

*The American Hardware Corporation*

NEW BRITAIN, CONNECTICUT

P. & F. Corbin  
of Chicago

P. & F. Corbin  
of New York

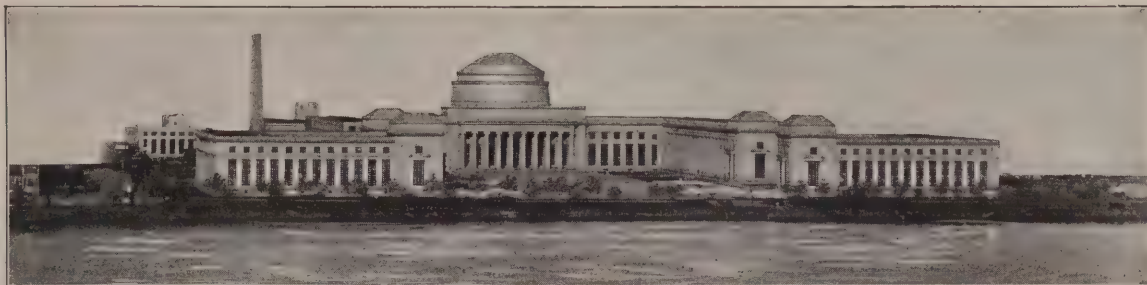
P. & F. Corbin Div.  
Philadelphia



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Massachusetts Institute of Technology, Boston

## Reasons why "85% MAGNESIA" is indorsed by the highest authorities

For more than a quarter of a century "85% Magnesia" coverings for pipes and boilers have been regarded as the highest standard of Heat-Insulation.

The Engineers' Building in New York and the new Massachusetts Institute of Technology here pictured, *both fully equipped with "85% Magnesia" coverings*, are pertinent illustrations of the attitude of the highest engineering authorities towards "85% Magnesia" as the perfect insulation.

The exclusive use of "85% Magnesia" coverings in the U. S. Navy, its almost exclusive use on locomotives, its predominant use in power- and heating-plants, its use in most of the skyscrapers, terminals, public buildings and big hotels, all give ample proof that Architects and Engineers fully recognize that the insulation value of "85% Magnesia" is far in advance of any other material practicable for this purpose.

### Economy and Efficiency

The real value of a pipe and boiler covering can only be measured in terms of actual B.T.U. of heat saved, and in every test of this character "85% Magnesia" coverings have amply proved their superiority over all other coverings. The actual saving in coal, spread over a short term of years, will not only pay the whole cost of the installation, but also a handsome permanent dividend on the investment cost thereof.

### Durability and Permanency

"85% Magnesia" coverings show no deterioration or loss of efficiency over a very long period. Instances are common where, after as long as twenty years, they are just as efficient as the day they were applied. This is a point of supreme importance which every Architect and Engineer will readily recognize.



Engineers' Building, New York

### Standardization

"85% Magnesia" coverings are made to standard sizes to fit all regular-sized steam- and hot-water pipes.

### The Magnesia Specification

The absence of well agreed upon and authoritative standards for the application of pipe and boiler coverings led the Magnesia Association to prepare a standardized specification for the use of Architects and Engineers. It is sent free on request.

This scientific Specification embodies the practical experience of the members as indorsed by the leading heat and power engineers of the country. It is complete in detail for every kind of application, and should be kept in your files for reference.

### "Let '85% Magnesia' Defend Your Steam"

This is a new Handbook on Heat-Insulation, dealing with both the theory and practise of the subject, and is also sent free on request.

MAGNESIA ASSOCIATION OF AMERICA, 702 BULLETIN BLDG., PHILADELPHIA, PA.

(The member companies of this Association are contractors to the U. S. Army and Navy and to munition plants.)

#### EXECUTIVE COMMITTEE

George D. Crabbs, The Philip Carey Co., Cincinnati, Ohio  
Alvin M. Ehret, Ehret Magnesia Mfg. Co., Valley Forge, Pa.

J. R. Swift, The Franklin Mfg. Co., Franklin, Pa.  
R. V. Mattison, Jr., Keasbey & Mattison Co., Ambler, Pa.

# Selected List of Manufacturers' Publications

FOR THE SERVICE OF ARCHITECTS, ENGINEERS, AND CONTRACTORS

The publications listed in these columns are the most important of those issued by manufacturers represented in the advertising pages of THE ARCHITECTURAL FORUM. They may be had upon direct application to the manufacturers.

## ARCH CONSTRUCTION, TIMBREL TILE

**Guastavino Co., R.**, Fuller Building, New York, N. Y.  
Portfolio. 10½ x 13½ in. Plates.

## BRICK

- American Enameled Brick and Tile Co.**, 52 Vanderbilt Avenue, New York.  
Enameled Brick. Catalog. 6 x 9¼ in. 25 pp. Color plates.  
**Claycraft Brick Co.**, 907 Hartman Building, Columbus, Ohio.  
Booklet. 6 x 9 in. 39 pp. Plates showing examples of work.  
**Hydraulic-Press Brick Co.**, St. Louis.  
Bonds and Mortars in the Wall of Brick. Treatise on brick design. 8½ x 11½ in. 27 pp.  
Brick Scales and Tables. Fifteen scales for vertical and horizontal measurements, with explanatory booklet and tables. 8 x 10 in. 32 pp.  
Moulded and Ornamental Brick. Catalog. 4½ x 6¼ in. 140 pp.  
The Brick Church and Parish House. Book of designs with floor plans from drawings submitted in competition. 10¾ x 13½ in. 80 pp.  
**Sayre & Fisher Co.**, 261 Broadway, New York.  
Brick — Enameled and Front. Catalog. 6 x 9 in. 24 pp. Color plates.  
Everything in Brick. Illustrated. Folder. 7¼ x 9 in.  
**Western Brick Co.**, Danville, Ill.  
The Art of Stippling. Brochure giving history of development of stippling and its application to face brick. 4 x 6 in. 24 pp.  
Where Western Brick Were Used, 1914-1915. Booklet. 4½ x 6 in. 30 pp.

## BUILDING MATERIALS

**Johns-Manville Co., H. W.**, Madison Avenue, New York.  
J-M Building Materials. Booklet. 3½ x 6 in. 24 pp.

## CEMENT, PORTLAND

- Atlas Portland Cement Company, The**, 30 Broad Street, New York.  
Handbook and Treatise. Concrete in Factory Construction. 6½ x 8¼ in. 250 pp.  
Early Stucco Houses, with modern stucco specifications. Booklet. 8½ x 11 in. 24 pp.  
Choosing the Garage, describing actual construction. Booklet. 8 x 10½ in. 26 pp.  
Commercial Garages, with construction notes and architectural treatment. Booklet. 8 x 10½ in. 12 pp.  
Color Tones in Stucco. Booklet with colored plates. 8½ x 11 in. 24 pp.  
Building a Bungalow. Booklet. 8½ x 11 in. 18 pp. 4 color plates.  
Concrete on the Farm. Handbook with useful data. 8 x 10½ in. 98 pp.  
**Lehigh Portland Cement Co., The**, Allentown, Pa.  
Forty-one Concrete Reasons. Booklet. 6 x 9 in. 34 pp.  
Cement Facts. Booklet. 5¼ x 6¼ in. 18 pp.  
The Expense-Proof Farm. Booklet. 6 x 9 in. 100 pp.  
Lehigh Portland Cement. Illustrated. Booklet. 8¼ x 12½ in. 42 pp.  
**Sandusky Cement Co., The**, Dept. S., Engineers Building, Cleveland, Ohio.  
Medusa White Portland Cement. Booklet. 8½ x 11 in. 52 pp.  
Medusa Waterproofed White Portland Cement. Booklet. 6 x 9 in. 20 pp.  
Medusa Waterproofed Gray Portland Cement. Booklet. 6 x 9 in. 20 pp.

## CHIMNEYS

**Heinicke, Inc., H. R.**, 147 Fourth Avenue, New York.  
Chimneys. Bulletin. Methods of construction.

## CONDUIT

**National Metal Molding Co.**, 1113 Fulton Building, Pittsburgh.  
Handbook on National Metal Molding. Complete details and installation instructions. 4¼ x 6 in. 96 pp.  
Bulletin No. 101. National Metal Moldings and Fittings. 8½ x 10 in. 32 pp.

## CONSTRUCTION, FIREPROOF

**General Fireproofing Co., The**, Youngstown, Ohio.  
Fireproofing Handbook. 6 x 9 in. 112 pp.  
**Trussed Concrete Steel Co.**, Steel Building, Dept. 57, Youngstown, Ohio.  
Truscon Steel Buildings. Catalog containing details and full information. 8½ x 11 in. 24 pp.  
Kahn Building Products. Catalog containing tables, details, and complete information. 6 x 3½ in. 100 pp.

## CONVEYORS, GRAVITY

**Otis Elevator Company**, Eleventh Avenue and 26th Street, New York.  
Otis Gravity Conveyors. Catalog. 6 x 9 in. 56 pp.

## DOORS, WINDOWS, AND TRIM, METAL

- Detroit Steel Products Co.**, 3117 East Grand Boulevard, Detroit, Mich.  
The Fenestra Line. Catalog. 8½ x 11 in. 15 sections. Blue prints.  
**Lupton's Sons Co., David**, Witte and Tulip Streets, Philadelphia, Pa.  
Lupton Service and Products, No. 9. Descriptive catalog with drawings and data for specifications. 8½ x 11 in. 100 pp. and cover.  
Air, Light, and Efficiency. Booklet. Daylight illumination as practised in the modern factory building.  
**Merchant & Evans Co.**, Philadelphia.  
Red Book. Catalog. 5½ x 8¼ in. 190 pp.  
**Trussed Concrete Steel Co.**, Steel Sash, Dept. 57, Youngstown, Ohio.  
United Steel Sash. Catalog. Details and specifications. 8½ x 11 in. 128 pp.

## DUMBWAITERS

**Sedgwick Machine Works**, 182 Liberty Street, New York.  
Service Sheets. Standard specifications, plans, etc. 16½ x 21½ in.

## ELECTRICAL EQUIPMENT

- Hart & Hegeman Mfg. Co., The**, 346 Capitol Ave., Hartford, Conn.  
Catalog O. H & H Switches and Paiste Wiring Material. 9 x 10½ in. 106 pp.  
**Hart Mfg. Co.**, Hartford, Conn.  
"Diamond H" Switches and Receptacles. Descriptive booklet. 4 x 8¼ in. 24 pp.

## ELEVATORS

- Otis Elevator Company**, Eleventh Avenue and 26th Street, New York.  
Otis Electric Traction Elevators. Bulletin. 6 x 9 in. 28 pp.  
Otis Residence Elevators. Bulletin. 6 x 9 in. 16 pp.  
**Sedgwick Machine Works**, 182 Liberty Street, New York.  
Selecting an Invalid Elevator. Booklet. 4¼ x 8¼ in. 8 pp.

## ESCALATORS

**Otis Elevator Company**, Eleventh Avenue and 26th Street, New York.  
Otis Escalators. Bulletin. 6 x 9 in. 36 pp.

## FAIENCE, ARCHITECTURAL

**Rookwood Pottery Co.**, Cincinnati.  
Faience Catalog with portfolio of plates. 9½ x 12½ in. 64 pp.

## FLOORING

- Armstrong Cork & Insulation Co.**, 132 24th St., Pittsburgh.  
Linotile Floors. Booklet. 6 x 9 in. 32 pp.  
**Kennedy, Inc., David E.**, 55 Fifth Avenue, New York.  
Nonpareil Cork Tile. Booklet showing patterns. 3½ x 5½ in. 34 pp.  
Folder showing colors of tiles. 3½ x 5½ in. 4 pp.  
Everlastic Tile. Folder. 3¼ x 6¼ in. 4 pp.  
Mas-Oleum Floor. (Mastic Linoleum.) Folder. Specification forms. 7½ x 9 in. 4 pp.  
**Sonneborn Sons, Inc., L.**, Dept. 4, 264 Pearl Street, New York.  
Lapidolith Specifications. Booklet. 8½ x 10½ in.  
Scientific Investigation of the Action of Lapidolith on Concrete by Prof. R. J. Colony. Booklet.

## GARDEN POTTERY — See Pottery, Garden.

## GLASS CONSTRUCTION

- Berger Manufacturing Co.**, Canton, Ohio.  
Berger's Raydiant Sidewalk Lights. Catalog T. F. 8½ x 11 in. 42 pp.  
**Keppeler Glass Constructions Inc.**, Architects Building, 101 Park Avenue, New York.  
Bulletin No. 126. 8½ x 11¼ in. 12 pp.  
Bulletin No. 202. 9 x 12 in. 6 pp.  
Bulletin No. 203. 9 x 12 in. 4 pp.  
Bulletin No. 205. 9 x 12 in. 6 pp.  
**Lord & Burnham Co.**, 42d Street Building, New York.  
Some Greenhouses We Have Built. Illustrations. Completed work. Catalog. 9½ x 12½ in. 98 pp.





# Cause —

*The use of*  
**RAYMOND**  
**Concrete Piles**

results in a structure whose foundations you KNOW are trustworthy—because the very process of forming each individual Raymond Concrete Pile is a guarantee that every pile in every pier is trustworthy. Do YOU know the Raymond method? Let us tell you about it.

# —and Effect

*A Form  
 for Every Pile  
 A Pile  
 for Every Purpose*

**Raymond Concrete Pile Co.**

New York: 140 Cedar Street

Chicago: 111 West Monroe Street

Raymond Concrete Pile Co., Ltd., Montreal, Canada



SELECTED LIST OF MANUFACTURERS' PUBLICATIONS — *Continued from page 22*

## HARDWARE

- Columbian Hardware Co., The**, Cleveland, Ohio.  
Making It Easier to Buy Columbian Sash Pulleys. Folder.  
3¼ x 8¼ in. 14 pp.
- Corbin, P. & F.**, New Britain, Conn.  
Colonial Hardware. Booklet. 5 x 7 in. 32 pp.  
Corbin Door Checks. Catalog. 5 x 7 in. 40 pp.  
Corbin Door Knockers. Booklet. 5 x 7 in. 24 pp.  
General Catalog. 10½ x 13 in. 1200 pp.
- Reliance Ball Bearing Door Hanger Co.**, 284 Starr Street,  
Brooklyn, New York.  
Door Hangers, etc. Catalog. 8 x 9½ in. 32 pp.
- Russell & Erwin Mfg. Co.**, New Britain, Conn.  
General Catalog. 9 x 12 in. 1250 pp.  
Russwin Period Design Booklet. 6 x 8 in. 72 pp.  
Russwin Fire Exit Bolt Catalog. 6 x 9 in. 46 pp.  
Russwin Casement Window Hardware. Booklet. 6 x 9 in. 32 pp.
- Stanley Works, The**, New Britain, Conn.  
Wrought Hardware Catalog. Describing wrought steel hinges,  
butts and door bolts. 6½ x 10 in. 260 pp.  
Stanley's Wrought Steel Garage Door Hardware. Booklet.  
3¼ x 6¼ in. 8 pp.  
Properly Hung Doors. Booklet. 5 x 7½ in. 16 pp.  
"Stanley" Sherardizing. Descriptive booklet. 3½ x 6¼ in. 4 pp.
- Vonnegut Hardware Company**, Indianapolis.  
Von Duprin Self-Releasing Fire Exit Device. Catalog 12-F.

## HEATING EQUIPMENT

- American Blower Co.**, Detroit, Mich.  
"A B C" Heaters. Bulletin. 8½ x 11 in. 24 pp.  
Vento Cast-Iron Hot-Blast Heater. Bulletin. 8½ x 11 in. 44 pp.
- American Radiator Co.**, 816 S. Michigan Avenue, Chicago.  
The Ideal Fitter. Handbook of heating and ventilating speci-  
fication data. 6½ x 3¼ in. 336 pp.  
Ideal Smokeless Down Draft Boilers. Booklet. 8½ x 11 in. 24 pp.
- Boynton Furnace Co., The**, 106 West 37th Street, New York.  
Square Pot Heaters. Catalog. 7 x 9½ in. 60 pp.
- Crane Co.**, 836 South Michigan Avenue, Chicago.  
Steam Goods. Complete pocket catalog. 4½ x 6 in. 775 pp.
- Gorton & Lidgerwood Co.**, 96 Liberty Street, New York.  
Modern House Heating. Catalog No. 88. 4¼ x 7 in. 32 pp.
- Jenkins Bros.**, 80 White Street, New York.  
Catalog and Price List. 4 x 6¼ in. 256 pp.
- Kelsey Heating Co., The**, 238 James Street, Syracuse, N. Y.  
Architects' Portfolio. 12 plates showing plans, heating, specifica-  
tions, and layouts. 8½ x 11 in.  
Kelsey System of Heating and Ventilating. Booklet. 36 pp.  
Kelsey Warm Air Generators. Booklet. 32 pp.
- Lord & Burnham Co.**, 42d Street Building, New York.  
Burnham Boilers. Catalog No. 56. 4 x 10 in. 19 pp.
- Sturtevant Co., B. F.**, Dept. B, Hyde Park, Boston, Mass.  
Heating and Ventilation. Treatise. 6½ x 9 in. 325 pp.  
Heating and Ventilating Layouts. Blue print book. Bulletin  
No. 227. 8½ x 11 in. 28 pp.  
Sturtevant Heaters. A book for architects. 8½ x 11 in. 32 pp.
- United States Radiator Corporation**, Detroit.  
A Modern "House Warming." Booklet. 6 x 9 in. 30 pp.  
The "Complete Line." Technical data. Catalog. 4¼ x 7¼ in.  
270 pp.

## HOISTS

- Gillis & Geoghegan**, 544 West Broadway, New York.  
The G & G Telescopic Hoists (all models). Bulletin. 8½ x 11 in.  
16 pp.  
The G & G Standard 17 x 24 in. Hoisting Cans with Side Handles  
and Swing Bails. Booklets A and B. 16 pp.

## HOLLOW TILE — See Tile, Hollow

## INSULATION

- Armstrong Cork & Insulation Co.**, 132 24th Street, Pittsburgh.  
Nonpareil Corkboard Insulation. Scientific treatise. 6 x 9 in.  
130 pp.  
Nonpareil High Pressure Covering. Scientific treatise. 6 x 9 in.  
84 pp.
- Cabot, Inc., Samuel**, 141 Milk Street, Boston.  
Service Sheets. Details of Construction and Methods of Using  
Cabot's Quilt. 16½ x 21½ in.
- Johns-Manville Co., H. W.**, Madison Avenue, New York.  
J-M Insulating Materials. Booklet. 3½ x 6 in. 24 pp.
- Magnesia Association of America**, 702 Bulletin Building, Phila-  
delphia, Pa.  
Let 85% Magnesia Defend Your Steam. A handbook of heat  
insulation. Magnesia specifications.

## JOISTS AND STUDS, PRESSED STEEL

- Berger Manufacturing Co.**, Canton, Ohio.  
Metal Lumber. Series of technical bulletins 12F especially pre-  
pared for architects. 8½ x 11 in. 32 pp.  
Ribplex. Bulletin No. 14. 8½ x 11 in. 4 pp.
- Trussed Concrete Steel Co.**, Dept. B-57, Youngstown, Ohio.  
Kahn Pressed Steel Construction. Catalog. Complete details  
and specifications. 8½ x 11 in. 32 pp.

## LATH, METAL

- Berger Manufacturing Co.**, Canton, Ohio.  
Berger's Expanded Metal Lath. Booklet. 3½ x 6 in. 44 pp.  
Supplement. 24 pp.

## LATH, METAL — Continued

- Bostwick Steel Lath Co.**, Niles, Ohio.  
Stucco on Truss Loop Metal Lath. Treatise. 6 x 9 in. 16 pp.  
Typical specifications. Standard specifications forms for stucco  
on metal lath.
- General Fireproofing Co., The**, Youngstown, Ohio.  
Herringbone Rigid Metal Lath. A complete catalog on Herring-  
bone Metal Lath. 6 x 9 in. 32 pp.
- North Western Expanded Metal Co.**, 934 Old Colony Building,  
Chicago, Ill.  
Kno-Burn Expanded Metal Lath. Treatise on metal lath, with  
details and specifications. 6 x 9 in. 52 pp.  
"Chanelath" Handbook. Treatise on ribbed metal lath details  
and specifications of its application to reinforced concrete con-  
struction and for plastering. 6 x 9 in. 64 pp.  
Designing Data for Reinforced Concrete Construction. Treatise  
on type of construction and application of expanded metal for  
reinforcement.
- Trussed Concrete Steel Co.**, Dept. H-57, Youngstown, Ohio.  
Hy-Rib Handbook. Specifications. 5½ x 7¼ in. 142 pp.
- Wright Wire Co.**, Worcester, Mass.  
General Catalog. Description and full particulars of wire lath,  
wire fencing, ornamental iron work, elevator cabs, railings,  
partitions, and grille work. 6 x 9 in. 224 pp.  
Wire Lath. Booklet L. Shows where Wright wire lath has been  
used. 3½ x 6¼ in. 16 pp.

## LIGHTING EQUIPMENT

- Ivanhoe-Regent Works of General Electric Co.**, Cleveland.  
Regent Semi-Indirect Lighting Bowls. Catalog No. 108. 8 x 10½  
in. 48 pp.  
Holograph Prismatic Reflectors and Fittings. Catalog No. 800.  
4 x 7 in. 50 pp.  
Ivanhoe Metal Reflectors and Fittings. Catalog No. 303. 4 x 7 in.  
50 pp.  
Rozelle Color-Decorated Bowls and Shades. Catalog No. 235.  
8 x 10½ in. 16 pp.
- Luminous Unit Co.**, St. Louis.  
Brascolite — The Modern Semi-Indirect Lighting System. Cata-  
log No. 5. 8¼ x 10¼ in. 24 pp.  
Brascolite Data. Scientific data sheets. Portfolio. 9 x 11½ in.  
Blue prints.  
Agilites. Folder catalog. All-glass lighting fixtures. 5¼ x 8 in.  
8 pp.
- McFaddin & Co., H. G.**, 42 Warren Street, New York.  
Emeralite. Booklet. Colored plates. 3½ x 6¼ in. 32 pp.
- National X-Ray Reflector Co.**, 243 West Jackson Boulevard,  
Chicago.  
Engineering Data Book. Technical handbook. 6 x 9 in. 125 pp.  
Illumination from Concealed Sources — How to Plan and Specify  
Indirect Lighting. Scientific treatise. 12 x 15 in. 52 pp. 36  
detail drawings.
- St. Louis Brass Mfg. Co.**, St. Louis.  
"Concealite" Catalog A. Lighting fixtures for auditoriums,  
banks, show windows, etc., from concealed or semi-concealed  
sources. 7½ x 10½ in. 20 pp.

## METAL LATH — See Lath, Metal.

## METAL TRIM — See Doors, Windows, and Trim, Metal.

## METAL WORK, ORNAMENTAL

- Polachek Bronze and Iron Co., John**, 480-494 Hancock Street,  
Long Island City, N. Y.  
Distinctive Metal Work. Booklet. 8½ x 11 in. 6 pp.
- Smyser-Royer Company**, 1225 Race Street, Philadelphia, Pa.  
Portfolio illustrating standards and other exterior lighting  
fixtures in bronze and iron. 4½ x 10¼ in. 175 plates.
- Tuttle & Bailey Mfg. Co.**, 52 Vanderbilt Avenue, New York.  
Special Designs of Grilles and Screens in Bronze, Brass, Iron,  
and Steel. Catalog No. 66A. 6½ x 10 in. 40 pp.
- Winslow Bros. Company**, 4600-4700 West Harrison Street, Chicago.  
P. O. Box No. 803.  
Ornamental Iron and Bronze. Illustrations of completed work.  
8½ x 11 in. 300 pp.

## OFFICE SUPPLIES, ARCHITECTS'

- Dixon Crucible Co., Joseph**, Dept. 224-J, Jersey City, N. J.  
"Eldorado" — The Master Drawing Pencil. Booklet.

## ORNAMENTS, PLASTIC

- Jacobson & Company**, 241 East 44th Street, New York.  
Architectural and Decorative Ornaments. Catalog. 9¼ x 12¼  
in. 192 pp.

## PAINTS, VARNISHES, AND WOOD FINISHES

- Berry Bros.**, Detroit, Mich.  
Natural Woods and How to Finish Them. Complete varnish  
specifications. 8½ x 11 in. 94 pp.  
Luxeberry Cement Coating. Color card. 3½ x 8½ in. 3 pp.
- Boston Varnish Co.**, Everett Station, Boston.  
Kyanize Enamel. Specifications. Booklet. 5 x 7 in. 20 pp.  
Kyanize White Enamel. Directions. Circular. 3½ x 6 in. 8 pp.  
Price List of Varnishes and Enamels. 3½ x 6 in. 24 pp.

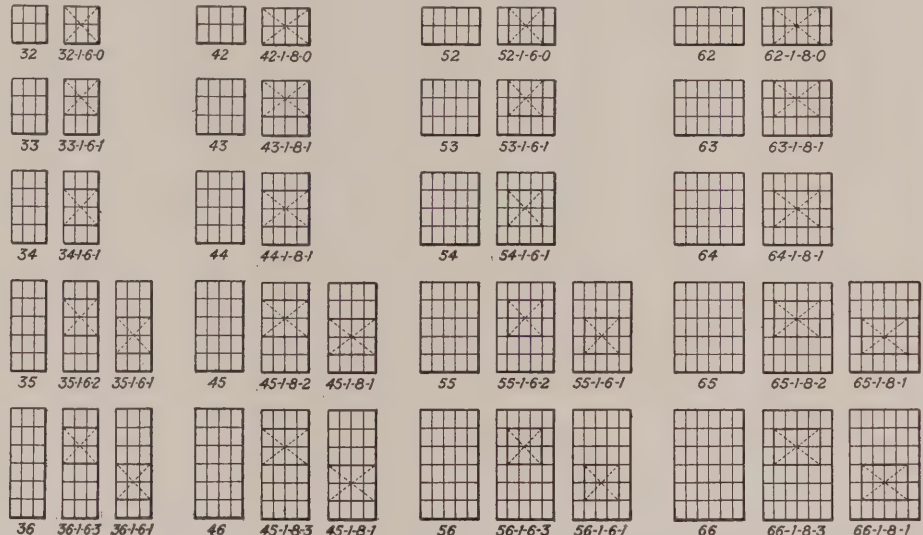


# 96 Varieties of UNITED STEEL SASH in our Warehouse Stock

Table of Widths of Window Openings

| Width of Window Openings  | Size of Glass | Total Lights Wide | No. Sash Units |
|---------------------------|---------------|-------------------|----------------|
| 3' 3"                     | 12 x 18       | 3                 | 1              |
| 3' 9"                     | 14 x 20       | 3                 | 1              |
| 4' 3 1/2"                 | 12 x 18       | 4                 | 1              |
| 4' 11 1/2"                | 14 x 20       | 4                 | 1              |
| 5' 4"                     | 12 x 18       | 5                 | 1              |
| 6' 2"                     | 14 x 20       | 5                 | 1              |
| 6' 4 1/2"                 | 12 x 18       | 6                 | 1              |
| 6' 8" to 6' 9"            | 12 x 18       | 6                 | 2              |
| 7' 4 1/2"                 | 14 x 20       | 6                 | 1              |
| 7' 8" to 7' 9"            | 14 x 20       | 6                 | 2              |
| 8' 9" to 8' 10"           | 12 x 18       | 8                 | 2              |
| 10' 0 1/2" to 10' 2 1/2"  | 12 x 18       | 9                 | 3              |
| 10' 1" to 10' 2"          | 14 x 20       | 8                 | 2              |
| 10' 10" to 10' 11"        | 12 x 18       | 10                | 2              |
| 11' 1" to 11' 3"          | 12 x 18       | 10                | 3              |
| 11' 6 1/2" to 11' 8 1/2"  | 14 x 20       | 9                 | 3              |
| 12' 1 1/2" to 12' 3 1/2"  | 12 x 18       | 11                | 3              |
| 12' 6" to 12' 7"          | 14 x 20       | 10                | 2              |
| 12' 9" to 12' 11"         | 14 x 20       | 10                | 3              |
| 12' 11" to 13' 0"         | 12 x 18       | 12                | 2              |
| 13' 2" to 13' 4"          | 12 x 18       | 12                | 3              |
| 13' 5 1/2" to 13' 8 1/2"  | 12 x 18       | 12                | 4              |
| 13' 11 1/2" to 14' 1 1/2" | 14 x 20       | 11                | 3              |
| 14' 2 1/2" to 14' 4 1/2"  | 12 x 18       | 13                | 3              |
| 14' 11" to 15' 0"         | 14 x 20       | 12                | 2              |
| 15' 2" to 15' 4"          | 14 x 20       | 12                | 3              |
| 15' 3" to 15' 5"          | 12 x 18       | 14                | 3              |
| 15' 5 1/2" to 15' 8 1/2"  | 14 x 20       | 12                | 4              |
| 15' 6 1/2" to 15' 9 1/2"  | 12 x 18       | 14                | 4              |
| 16' 3 1/2" to 16' 5 1/2"  | 12 x 18       | 15                | 3              |
| 16' 4 1/2" to 16' 6 1/2"  | 14 x 20       | 13                | 3              |
| 17' 4" to 17' 6"          | 12 x 18       | 16                | 3              |
| 17' 7" to 17' 9"          | 14 x 20       | 14                | 3              |
| 17' 7 1/2" to 17' 10 1/2" | 12 x 18       | 16                | 4              |
| 17' 10 1/2" to 18' 1 1/2" | 14 x 20       | 14                | 4              |
| 18' 4 1/2" to 18' 6 1/2"  | 12 x 18       | 17                | 3              |
| 18' 9 1/2" to 18' 11 1/2" | 14 x 20       | 15                | 3              |
| 19' 5" to 19' 7"          | 12 x 18       | 18                | 3              |
| 19' 8 1/2" to 19' 11 1/2" | 12 x 18       | 18                | 4              |
| 20' 0" to 20' 2"          | 14 x 20       | 16                | 3              |
| 20' 3 1/2" to 20' 6 1/2"  | 14 x 20       | 16                | 4              |
| 21' 2 1/2" to 21' 4 1/2"  | 14 x 20       | 17                | 3              |
| 21' 5 1/2" to 21' 7 1/2"  | 12 x 18       | 20                | 4              |
| 22' 5" to 22' 7"          | 14 x 20       | 18                | 3              |
| 22' 8 1/2" to 22' 11 1/2" | 14 x 20       | 18                | 4              |
| 23' 10 1/2" to 24' 1 1/2" | 12 x 18       | 22                | 4              |
| 25' 1 1/2" to 25' 4 1/2"  | 14 x 20       | 20                | 4              |
| 25' 11 1/2" to 26' 2 1/2" | 12 x 18       | 24                | 4              |
| 27' 6 1/2" to 27' 9 1/2"  | 14 x 20       | 22                | 4              |
| 29' 1 1/2" to 30' 2 1/2"  | 14 x 20       | 24                | 4              |

You have a choice of 48 distinct types — each in two glass sizes — in stock units of United Steel Sash. By combining these units you can meet any practical requirements as regards ventilation and size of window opening. Best of all, these stock units are stored in our warehouse ready for immediate shipment. Avoid delays and save money by selecting stock units of United Steel Sash.



Stock Units of United Steel Sash. Furnished in two Glass sizes, 12" x 18" and 14" x 20"

## Select Your Sash from These Units and Tables

Tables show widths and heights of window openings and sizes of sash to fit them. Diagram shows types of sash and arrangement of ventilation for each size of unit. In selecting units always use the same glass size as regards width and height.

We also furnish Semi-Stock Sash (ventilators carried in stock) and To-Order Sash in pivoted and sliding sash, continuous sash, partitions, doors, etc.

Table of Heights of Window Openings

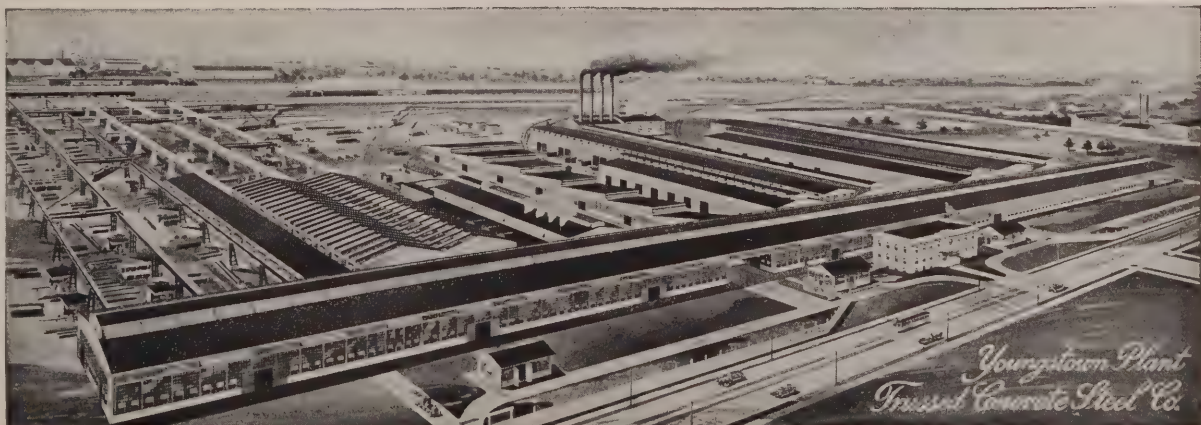
| Height of Window Openings | Size of Glass | Total Lights High | No. Sash Units |
|---------------------------|---------------|-------------------|----------------|
| 3' 2"                     | 12 x 18       | 2                 | 1              |
| 3' 6"                     | 14 x 20       | 2                 | 1              |
| 4' 8 1/2"                 | 12 x 18       | 3                 | 1              |
| 5' 2 1/2"                 | 14 x 20       | 3                 | 1              |
| 6' 3"                     | 12 x 18       | 4                 | 1              |
| 6' 11 1/2"                | 14 x 20       | 4                 | 1              |
| 7' 9 1/2"                 | 12 x 18       | 5                 | 1              |
| 8' 7 1/2"                 | 14 x 20       | 5                 | 1              |
| 9' 4"                     | 12 x 18       | 6                 | 1              |
| 10' 4"                    | 14 x 20       | 6                 | 1              |

Write for Stock Sash Pamphlet or Complete Sash Handbook



## Trussed Concrete Steel Co.

Steel Sash Dept. 57  
Youngstown, Ohio  
Representatives in Principal Cities



The warehousing and manufacturing facilities for United Steel Sash



## SELECTED LIST OF MANUFACTURERS' PUBLICATIONS—Continued from page 24

## PAINTS, VARNISHES, AND WOOD FINISHES—Continued

- Dixon Crucible Co., Joseph**, Dept. 224-J, Jersey City, N. J.  
Philosophy of Protective Paint.  $3\frac{3}{4} \times 6\frac{1}{4}$  in. 24 pp.
- Lowe Bros. Co., The**, 101 Park Ave., New York and Dayton.  
Architects' Mellotone Handbook.  $3 \times 8$  in. 27 pp. Color plates.  
High Standard Paint and Varnish Specifications. Handbook.  
 $4\frac{1}{2} \times 7$  in. 70 pp.  
Paint and Painting. Directions and data.  $5 \times 9$  in. 30 pp.  
Varnish and Varnishing. Treatise.  $5 \times 9$  in. 44 pp.
- Murphy Varnish Co.**, Newark, N. J.  
The House that Found Itself. Booklet.  $6\frac{1}{4} \times 9\frac{1}{4}$  in. 28 pp.  
Harmony in Interior Decoration. Booklet.  $5\frac{3}{4} \times 8\frac{3}{4}$  in. 56 pp.  
Dealer's Descriptive List. Booklet.  $4\frac{1}{2} \times 6\frac{3}{4}$  in. 28 pp.  
Beautiful Boats and How to Care for Them. Booklet.  $5\frac{3}{4} \times 8\frac{3}{4}$  in. 50 pp.
- O'Brien Varnish Company, The**, 43 Washington Street, South Bend, Ind.  
Specification Data. Information concerning O'Brien line of varnishes and interior finishes.  $8\frac{3}{4} \times 11$  in.
- Smith & Co., Edward**, P. O. Box 1780, New York.  
Architects' Handbook. Specifications.  $5 \times 7\frac{1}{2}$  in. 24 pp.
- Toch Brothers**, Dept. 97, 320 Fifth Avenue, New York.  
Specifications for Damp-proofing, Waterproofing, Enameling, and Technical Painting.  $8\frac{1}{2} \times 11$  in. 48 pp.  
Toch Brothers Preservative Paints and Compounds. Booklet.  $5\frac{1}{2} \times 8\frac{1}{4}$  in. 36 pp.
- Wadsworth, Howland Co., Inc.**, 139 Federal Street, Boston.  
Bay State Finishes, Stains, and Varnishes. Catalog No. 10. Color cards.

## PARTITIONS, FOLDING AND ROLLING

- Folding Partition Co., Inc.**, 200 Broadway, New York, N. Y.  
Sectionfold Partitions. Catalog with detail sheet.  $20 \times 27$  in.

## PILES

- MacArthur Concrete Pile and Foundation Co.**, 120 Broadway, New York.  
The Pedestal Pile. Catalog. Engineering data.  $6 \times 9$  in. 64 pp.
- Raymond Concrete Pile Co.**, 140 Cedar Street, New York.  
Raymond Concrete Piles. Catalog.  $8\frac{1}{2} \times 11\frac{1}{4}$  in. 56 pp.

## PIPE

- Byers Company, A. M.**, 235 Water Street, Pittsburgh.  
Bulletin No. 26. Tables and Specifications. Bulletin (2d Edition. Enlarged and Revised).  $8\frac{1}{2} \times 11$  in. 24 pp.  
Bulletin No. 27. The Experience of Practical Men.  $8\frac{1}{2} \times 11$  in. 40 pp.  
Bulletin No. 30. An Investigation of Pipe Corrosion. Suggestions for avoiding rusty water and lengthening life of hot water pipes.  $8\frac{1}{2} \times 11$  in. 16 pp.  
Selection of Pipe for Modern Buildings. Booklet of special interest to architects.  $4 \times 6$  in.
- Central Foundry Company**, 90 West Street, New York.  
Soil Pipe and Fittings. Catalog.  $4 \times 7\frac{1}{2}$  in. 88 pp.  
The Lynn Drain Trap. A leaflet containing description.  
Combination Vent, Revent, and Drainage Fittings. Catalog.  $4\frac{1}{4} \times 6\frac{3}{4}$  in. 183 pp.
- National Tube Company**, Frick Building, Pittsburgh, Pa.  
Shelby Mechanical Tubing. Booklet.  $3\frac{1}{2} \times 6$  in. 35 pp.  
Boiler Tubes List No. 6. 1916. Booklet.  $4 \times 6\frac{1}{2}$  in. 16 pp.  
Pipe List No. 5. 1913. Booklet.  $4 \times 6\frac{1}{2}$  in. 20 pp.  
National Bulletins, Nos. 1 to 27, inclusive.  $8\frac{1}{2} \times 11$  in.  
National Pipe Standards. Booklet. Appendix to 1913 edition. Tables and useful information pertaining to tubular goods.  $4 \times 6\frac{1}{2}$  in. 400 pp.  
National Bulletin No. 25. National Pipe in Large Buildings. Booklet. Twenty years' progress in building construction, pipe specifications, engineering data from National Book of Standards and illustrations of many prominent "National"-ized buildings.  $8\frac{1}{2} \times 11$  in. 88 pp. 222 illustrations.  
The Modern Boiler Tube. Booklet. Describes material, tests, and specifications.  $7\frac{3}{4} \times 8\frac{3}{4}$  in. 40 pp. 4 illustrations.

## PLASTER

- Hydrated Lime Bureau of the National Lime Manufacturers' Association**, 1506 Arrott Bldg., Pittsburgh.  
Standard Specifications for Hydrated Lime Plastering. Pamphlet E.  $6\frac{1}{4} \times 9\frac{1}{4}$  in. 20 pp.  
Better Plastering and Better Acoustics. Bound booklet.  $6\frac{1}{4} \times 9\frac{1}{4}$  in. 40 pp.  
Better Methods in Concrete Construction. Bulletin No. A-5. Treatise on the use of hydrated lime in concrete.  $6 \times 8$  in. 16 pp.
- Kelley Island Lime & Transport Co.**, Cleveland, Ohio.  
Specifications for Hydrated Lime Plastering. Booklet.  $6 \times 9$  in. 20 pp.  
Hydrated Lime Plaster. Booklet.  $6\frac{1}{4} \times 9\frac{1}{4}$  in. 12 pp.  
The Perfect Finishing Lime. Booklet.  $4\frac{1}{2} \times 7\frac{1}{4}$  in. 34 pp.  
The Inside Walls. Booklet.  $3\frac{1}{4} \times 6\frac{1}{4}$  in. 8 pp.

## PLUMBING EQUIPMENT

- Crane Co.**, 836 South Michigan Avenue, Chicago.  
Plumbing Catalog.  $9 \times 12$  in. 834 pp.
- Kohler Co.**, Kohler, Wis.  
Kohler Catalog. Cloth bound.  $9\frac{1}{2} \times 11\frac{1}{4}$  in. 164 pp.  
Kohler of Kohler Book. Catalog.  $5\frac{1}{2} \times 8$  in. 68 pp.
- Standard Sanitary Mfg. Co.**, Dept. 4, Pittsburgh, Pa.  
"Standard" Catalog. General catalog of "Standard" line.  $9 \times 12$  in. 676 pp.  
"Standard" Plumbing Fixtures for the Home. Catalog.  
Factory Sanitation. Catalog and scientific treatise.  $9 \times 12$  in. 36 pp.

## PLUMBING EQUIPMENT—Continued

- Trenton Potteries Co.**, Trenton, N. J.  
Bathrooms of Character. Booklet.  $4 \times 7\frac{1}{4}$  in. 48 pp.  
Sanitary Pottery. Monthly house organ.  $6 \times 9$  in. 16 pp. Color plates.

## POTTERY, GARDEN

- Atlantic Terra Cotta Company**, 1170 Broadway, New York.  
Garden Pottery. Catalog.  $9 \times 12$  in. 12 pp.

## PUMPS

- Goulds Manufacturing Co.**, Seneca Falls, N. Y.  
All Types of Centrifugal and Reciprocating Power Pumps. Bulletins. 22 sections.  $7\frac{3}{4} \times 10$  in. Bound in  $8\frac{1}{2} \times 11$  in. cover.  
Handy Data on Power Pumping. Bulletin 112.  $7\frac{3}{4} \times 10$  in. 24 pp.

## ROOFING

- American Sheet & Tin Plate Co.**, Frick Building, Pittsburgh.  
Copper—Its Effect Upon Steel for Roofing Tin. Scientific treatise. New edition.  $8\frac{1}{2} \times 11$  in. 24 pp.  
Pocket Reference Book.  $2\frac{1}{2} \times 4\frac{1}{4}$  in. 168 pp.
- Barrett Company, The** (formerly The Barrett Mfg. Company). 17 Battery Place, New York City.  
Barrett's Specification Roofs—20-Year Guaranty Bond. Loose-leaf specifications with details.  $8\frac{1}{2} \times 14$  in.  
Foundation Waterproofing. Loose-leaf specifications.  $8\frac{1}{2} \times 14$  in.  
Tylike Shingles with Red or Green Crushed Slate Surface. For residences, etc. Descriptive booklet.  $6 \times 8$  in.  
Velvex Creosote Shingle Stains. Descriptive folder showing colors on wood.  $3\frac{1}{2} \times 6\frac{1}{2}$  in.
- Boyle & Co., Inc., John**, 112-114 Duane Street, New York.  
Opinions of Practical Builders. Instructions for using Bayonne Roof and Deck Cloth. Book S.  $3\frac{1}{2} \times 6$  in. 24 pp.
- Carey Co., The Philip**, Lockland, Cincinnati.  
Architects' Book of Carey Roofing Specifications.
- Creo-Dipt Co.**, 1025 Oliver Street, North Tonawanda, N. Y.  
Service Sheet 1. No. 28. Working Drawings of Construction of "Thatch" Roof. Standard specifications and instructions for design and construction of same.  $16\frac{1}{2} \times 21\frac{1}{2}$  in.
- General Slate Company**, 200 Devonshire Street, Boston.  
General Slate Company—Roofing Slate. Booklet.  $6 \times 9$  in. 16 pp.
- Johns-Manville Co., H. W.**, Madison Avenue, New York.  
J-M Corrugated Asbestos Roofing. Catalog.  $6 \times 9$  in. 32 pp.  
J-M Transite Asbestos Shingles. Catalog.  $6 \times 9$  in. 32 pp.
- Ludowici-Celadon Company**, 104 South Michigan Avenue, Chicago.  
Roofing Tile. A detailed reference for architects.  $9\frac{1}{4} \times 13\frac{1}{4}$  in. 106 pp.  
Roofing Tile Catalog.  $3\frac{3}{4} \times 9$  in. 10 pp.  
The Roof Beautiful. Booklet.  $6\frac{3}{4} \times 9\frac{1}{4}$  in. 40 pp. Color plates.  
Why Tile Is Best. Booklet.  $3\frac{3}{4} \times 6\frac{1}{4}$  in. 8 pp.
- Taylor Co., N. & G.**, 300 Chestnut Street, Philadelphia.  
A Guide to Good Roofs. Booklet.  $3\frac{3}{4} \times 5\frac{1}{2}$  in. 24 pp.  
Selling Arguments for Tin Roofing. Booklet.  $6 \times 9\frac{1}{4}$  in. 80 pp.  
Service Sheets. Working drawings showing details of construction of heavy ribbed and standing seam tin roofing; also color suggestions for tin roofs and tables of covering capacity of tin.  $16\frac{1}{2} \times 21\frac{1}{2}$  in.  
Standard Specifications for Tin Roofing Work.  $7\frac{1}{2} \times 9$  in.

## STONE

- Indiana Limestone Quarrymen's Association**, P. O. Box 505, Bedford, Ind.  
Indiana Limestone Booklet. General treatise.  $6 \times 9$  in. 40 pp.  
Indiana Limestone Booklet. Bank Buildings.  $6 \times 9$  in. 40 pp.  
\$12,000 House of Indiana Limestone. (Price, mention, and other drawings submitted in competition with report of Jury.)  $11 \times 14$  in. 46 pp.

## STORE FRONTS

- Detroit Show Case Co.**, 467 Fort Street, West, Detroit, Mich.  
Metal Store Front Construction. Handbook.  $8\frac{1}{2} \times 11$  in. 32 pp.  
With full size blue print details.  $16\frac{1}{2} \times 22$  in. folded to  $8\frac{1}{4} \times 11$  in.
- Kawneer Manufacturing Co.**, Niles, Mich.  
Architects' Portfolio of Details. 17 full size construction plates, loose leaf.  $34 \times 44$  in. Also 17 half size construction plates, bound.  $8\frac{1}{2} \times 11$  in.

## STUCCO BOARD

- Bishopric Manufacturing Co., The**, 910 Este Avenue, Cincinnati, Ohio.  
The Bishopric Mastic Products. Booklet.  $6 \times 9\frac{1}{2}$  in. 24 pp. Color plates.  
Built on the Wisdom of Ages. Booklet showing methods of using Bishopric Stucco Board.  $8\frac{1}{2} \times 11$  in. 48 pp.  
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## TELEPHONE SYSTEMS, INTERIOR

- Western Electric Co.**, 195 Broadway, New York.  
Western Electric Interphone Specifications. Handbook.  $8\frac{1}{4} \times 11$  in. 41 pp.





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SELECTED LIST OF MANUFACTURERS' PUBLICATIONS — *Continued from page 26*

## TERRA COTTA, ARCHITECTURAL

- American Terra Cotta & Ceramic Co.**, 2010 Peoples' Gas Building, Chicago.  
Specifications for Architectural Terra Cotta and Details of Construction. 14 plates.
- Atlantic Terra Cotta Co.**, 1170 Broadway, New York.  
Atlantic Terra Cotta. Monthly publication. 9 x 12 in. 12 pp.
- Conkling-Armstrong Terra Cotta Co.**, Philadelphia.  
Ornament and Details of Construction. Catalog. 9½ x 13 in.
- Midland Terra Cotta Co.**, 1515 Lumber Exchange Building, Chicago.  
Stock Terra Cotta. Loose-leaf portfolio. 10 x 15 in. 15 plates.
- New Jersey Terra Cotta Co.**, Singer Building, New York.  
The Victoria Building. Booklet. 8½ x 11 in. 10 pp.
- New York Architectural Terra-Cotta Co.**, 401 Vernon Avenue, Long Island City, N. Y.  
Architectural Terra Cotta. Booklet. 8 x 8½ in. 36 pp.
- Northwestern Terra Cotta Co., The**, 2525 Clybourn Avenue, Chicago.  
Architectural Terra Cotta. Booklet. Showing illustrations of buildings and details. 8½ x 11 in. 60 pp.
- South Amboy Terra Cotta Co.**, 150 Nassau Street, New York.  
Plates of Ornamental Detail and Construction. Portfolio.

## TILE, HOLLOW

- National Fire Proofing Co.**, 600 Federal Street, Pittsburgh.  
Builders' Handbook. Details of construction. 8½ x 11 in. 34 pp. Blue prints.
- Fireproof Houses of Natco Hollow Tile. Catalog. 8½ x 11 in. 30 pp.
- Standard Hollow Tile Fireproof Construction. Bulletin No. 171. Details, tables, tests. Color plates. 8½ x 11 in. 32 pp.
- Natco on the Farm. (1917 edition.) Catalog. 8½ x 11 in. 40 pp.

## TILE, STEEL

- General Fireproofing Co., The**, Youngstown, Ohio.  
Steel-Tile Handbook. Tables, formulas, specifications, etc., for tile floors and concrete work. 6 x 9 in. 32 pp.
- Trussed Concrete Steel Co.**, Dept. R-57, Youngstown, Ohio.  
Florestyle Construction. Booklet containing table and full information for specifying. 8½ x 11 in. 16 pp.

## UPHOLSTERY FABRICS

- Chase & Co., L. C.**, 89 Franklin Street, Boston.  
Chase Mohair Velvets. Booklet. Description of fabrics with color reproductions. 9½ x 12½ in. 10 pp.
- Chase Leatherwove. Folder. Descriptive of material and its uses. 3½ x 6½ in.

## VACUUM CLEANERS

- Sturtevant Co., B. F.**, Dept. B., Hyde Park, Boston.  
Sturtevant Vacuum Cleaners. Handbook for architects. No. 244. 8½ x 11 in. 36 pp.
- Western Electric Co.**, 195 Broadway, New York.  
Western Electric Vacuum Cleaner. Specifications. Bulletin. 8½ x 11 in. 62 pp.

## VENETIAN BLINDS

- Wilson Corporation, The J. G.**, 8 West 40th Street, New York.  
The Lighting and Ventilation of Modern Buildings. Treatise with working drawings. 8½ x 11 in. 12 pp.
- Leaflet No. 4. Color in relation to light reflecting power.

## VENTILATION

- American Blower Co.**, Detroit, Mich.  
American Sirocco Fans and Blowers. Bulletin. 8½ x 11 in. 52 pp.
- American Radiator Co.**, 816 So. Michigan Avenue, Chicago.  
"A B C" Steel Plate Fans. Bulletin. 8½ x 11 in. 28 pp.
- Ventilation by Vento Heaters. Booklet. 8 x 10½ in. 24 pp.
- Clarage Fan Co.**, Kalamazoo, Mich.  
Catalog No. 5. 6 x 9 in. 26 pp.
- Globe Ventilator Co.**, Dept. P, Troy, N. Y.  
Booklet. 4 x 9 in. 36 pp.
- Ohio Blower Co., The**, 9225 Detroit Avenue, Cleveland.  
Gospel of Fresh Air. Booklet. 4 x 9 in. 24 pp.
- Sturtevant Co., B. F.**, Dept. B, Hyde Park, Boston.  
Sturtevant Heaters. Catalog, containing data, curves, tables, and complete layouts for the use of architects in specifying heating and ventilating systems. 8½ x 11 in. 132 pp.
- Auto Force Ventilators. Bulletin No. 232. 8½ x 11 in. 12 pp.

## WALL BOARD

- Carey Co., The Philip**, Lockland, Cincinnati.  
Carey "Ceil-board" for Walls and Ceilings. Specifications. 8 x 11 in. 2 pp.

## WALL COVERINGS

- Standard Oil Cloth Company, Inc., The**, Dept. I, 320 Broadway, New York.  
Sanitas Modern Wall Covering. Booklet. 5 x 7 in. 28 pp. Color plates.
- Hints to Decorators. Booklet. 5 x 7 in. 12 pp. Colored inserts.
- What They Say About Sanitas. Booklet. 5 x 7 in. 27 pp.
- Selling Helps. Booklet. 5 x 7 in. 24 pp.

## WATERPROOFING

- Anti-Hydro Waterproofing Co.**, 9 Orchard Street, Newark, N. J. (Singer Building, N. Y. C.)  
Concrete Hardener Waterproofing. Booklet. 6½ x 8½ in. 8 pp.

## WATERPROOFING — Continued

- General Fireproofing Co., The**, Youngstown, Ohio.  
Waterproofing Handbook. 6 x 9 in. 88 pp.
- Sandusky Cement Co., The**, Dept. S, Engineers' Building, Cleveland, Ohio.  
Medusa Waterproofing. Booklet. 7 x 9 in. 36 pp.
- Sonneborn Sons, Inc., L.**, Dept. 4, 264 Pearl St., New York.  
Concrete and Lapidolith. Treatise on concrete construction and the use of Lapidolith with it. 5¼ x 8¼ in. 20 pp.
- Trus-Con Laboratories, The**, 1246 Trus-Con Building, Detroit, Mich.  
Architects' Handbook. 8½ x 11 in. 36 pp.
- Structural Waterproofing. 8½ x 11 in. 52 pp.
- Agatex Book. 5½ x 8 in. 18 pp.
- Descriptive Price List. 3½ x 6½ in. 24 pp.
- Wadsworth, Howland Co., Inc.**, 139 Federal Street, Boston.  
Bay State Brick and Cement Coating. Booklet No. 10. Color plates.

## WATER SYSTEMS

- Armstrong Cork & Insulation Co.**, 132 24th St., Pittsburgh.  
Drinking Water Systems. Treatise. 6 x 9 in. 48 pp.

## WINDOWS, CASEMENT

- Crittall Casement Window Co.**, Detroit, Mich.  
Universal Casements. Catalog No. 15, showing solid steel casement windows. Details. 9¼ x 12 in. 64 pp.
- Hope & Sons, Henry**, 103 Park Avenue, New York.  
Casement Windows. Details and sections. Catalog. 10 x 15 in. 187 pp.
- International Casement Co., Inc.**, Jamestown, N. Y.  
Casement Windows and Leaded Glass. Catalog. 10 x 14 in. 56 pp. Plates showing 16th century Tudor residences.

## WIRE FENCES

- Wright Wire Company**, Worcester, Mass.  
Excelsior Rust Proof Fencing. Illustrated and descriptive booklet. 3½ x 6 in. 16 pp.

## WOOD

- Arkansas Soft Pine Bureau**, 1120 Bank of Commerce Building, Little Rock, Ark.  
Architects' Manual. Handbook with grading rules, finishing and painting specifications, and standard moulding designs. 8½ x 11 in. 62 pp.
- Arkansas Soft Pine—How to Finish and Paint It. Descriptive of wood. Finishing specifications for interior and exterior use. 6½ x 8½ in. 26 pp.
- Not a House but a Home. Home construction hints for the layman. Description of wood. Cottage and residence designs, with introduction by Aymar Embury II, architect. 9 x 12 in. 36 pp.
- Gum Lumber Manufacturers' Association**, 1304 Bank of Commerce Building, Memphis, Tenn.  
Red Gum Facts. Catalog. 5½ x 8½ in. 20 pp.
- Technical Information about Red Gum. Catalog. 5½ x 9 in. 20 pp.
- North Carolina Pine Association**, 83 Bank of Commerce Building, Norfolk, Va.  
Architects' Reference Book. Booklet. 8½ x 11 in. 16 pp. Color plates.
- Home Builders' Book. 5 x 9 in. 24 pp. Color plates.
- Northern Hemlock and Hardwood Mfr's Assn.**, 205 F. R. A. Building, Oshkosh, Wis.  
Hardwood Inspection Rule Book. Handbook. 3¼ x 6 in. 107 pp.
- Beautiful Birch for Beautiful Woodwork. Illustrated treatise. 6¼ x 9¼ in. 35 pp.
- Serviceability and Qualities of Birch. Booklet. 8½ x 11 in. 7 pp.
- Rules for the Inspection of Hemlock Lumber. Booklet. 3¼ x 6¼ in. 32 pp.
- Southern Cypress Manufacturers' Association**, 1234 Hibernia Bank Building, New Orleans.  
Cypress Pocket Library. Covers all uses for cypress. 41 units. 3¼ x 5½ in.
- Southern Pine Association**, Dept. H-21, Interstate Bank Building, New Orleans, La.  
Rules for Grading Southern Yellow Pine Timbers. Treatise. 3½ x 6 in. 24 pp.
- Cresoted Wood Block Floors. Booklet. 7 x 10 in. 32 pp.
- Directions for Furnishing Southern Yellow Pine. Technical booklet. 7 x 10 in. 20 pp.
- Manual of Standard Wood Construction. Scientific handbook. 4½ x 6½ in. 150 pp.
- White Pine Bureau**, 2130 Merchants Bank Building, St. Paul, Minn.  
Specification Book—Classified Recommended Uses for White Pine. Illustrating the various standard grades and indicating their proper uses. 8½ x 11 in. 196 pp.
- Three Story Houses of New England. Architectural monograph. Vol. III, No. 1. 8½ x 11 in. 16 pp.
- Early Wooden Architecture of Andover, Mass. Monograph. Vol. III, No. 2. 8½ x 11 in. 16 pp.
- Old Houses of Newburyport, Mass. Monograph. Vol. III, No. 3. 8½ x 11 in. 16 pp.



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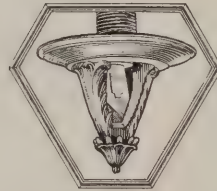
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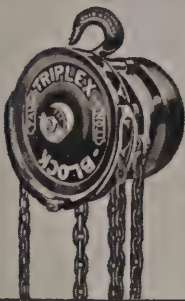
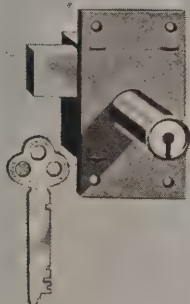
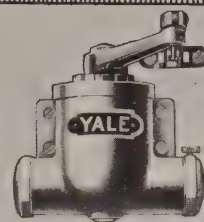
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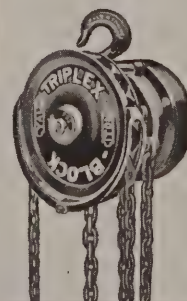
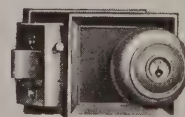
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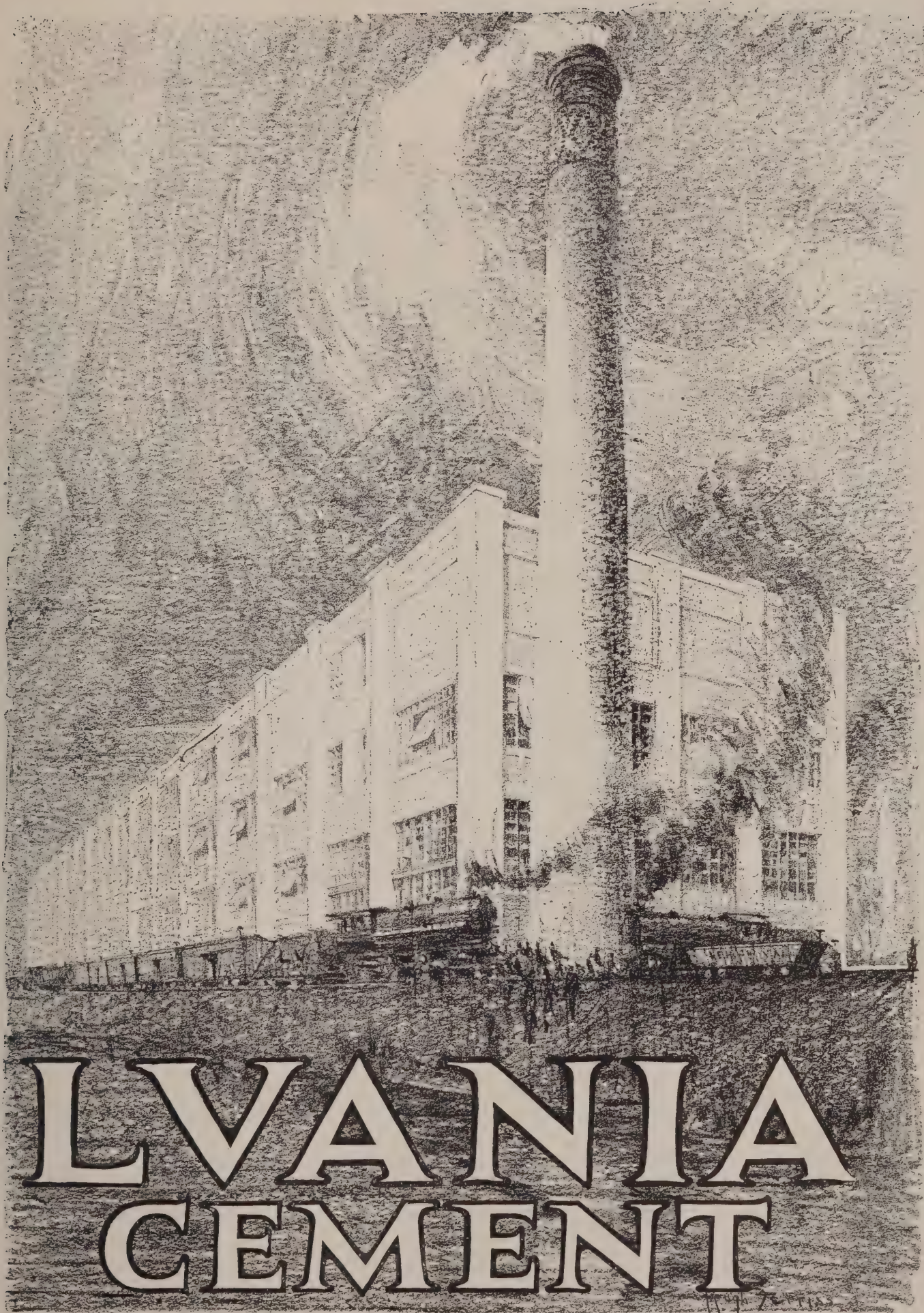
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This is a black, alkali-proof, waterproof elastic material for backing wood trim. It prevents the dampness and alkali in plaster and green masonry walls from warping and swelling the trim and damaging the wood finish.

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Extensively used on the underside of wood floors and on wood sleepers to prevent warping and rotting.

Write for interesting literature, Dept. 97

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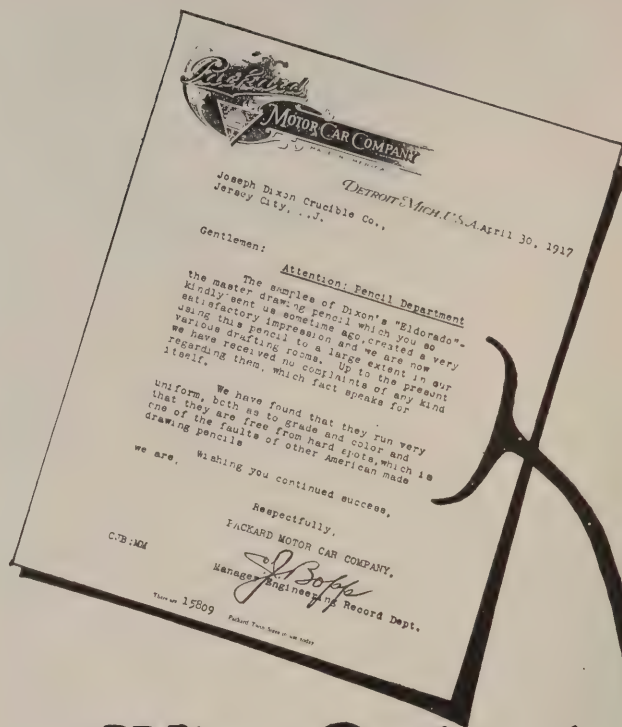
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*writes white on blueprints*

DIXON'S "ELDORADO" - the master drawing pencil - HB



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Design and construction under the direction of Thomas Rodd, Chief Engineer Union Station Co. and Robt. Trimball, Chief Engineer Maintenance of Way Pennsylvania Lines. General Contractors, Geo. A. Fuller Co.



## *Built on Waterproofed Foundations*



The mammoth Pennsylvania Freight Station at Chicago rests on foundations that are permanent and secure. The foundation walls of the sub-basement were made proof against water and water damage through the use of

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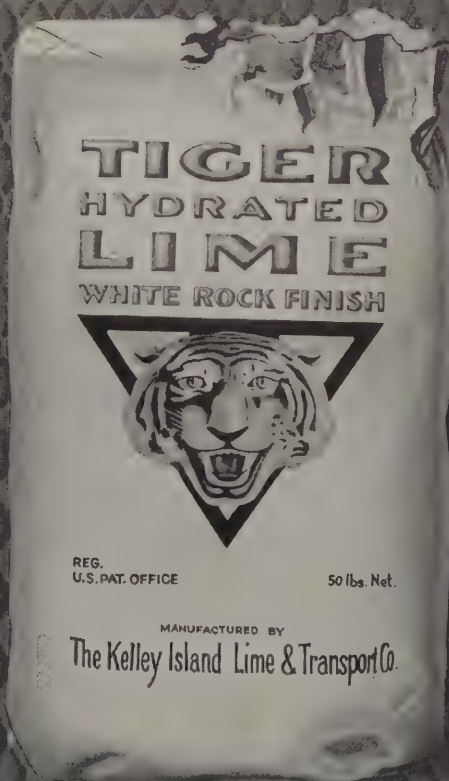


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All ventilators to be of the Rotary Ball-Bearing type,  
 { Metal top } of { galvanized }  
 { Glass top } of { copper }  
 rust-resisting metal, all interior members of angle iron, hot galvanized *after* forming and punching. The ventilators to turn sensitively on accurately machined bronze bearings, employing hard composition balls, and counter-weighted on outside. The ventilators to be equipped with outside louver dampers to throw accumulated dirt outside of building, louver to be operated from within by brass chains over brass pulleys. Gauge of metal\* to be The Ohio Blower Co., Cleveland, Ohio, Standard, as furnished in Swartwout Rotary Ball-Bearing Ventilators at regular prices. Top of collar and bottom of hood to be stiffened with galvanized angle iron rings.\*\*

\* If desired, give standard gauge as shown in table of dimensions on Standard Data Card, Sweet's Catalog or Catalog—"The Gospel of Fresh Air."

\*\* Follow with specifications for base—(see Data Card, "Sweet's" or Catalog).

Illustration shows the glass-top or "sky-light" ventilator with type of base as built in copper. The standard ventilator is of galvanized, rust-resisting sheet metal



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OFFICIAL Government Reports show that the average wind velocity at U. S. government observation stations is between nine and ten miles an hour. A wind velocity of five miles an hour (a condition which seems a "*dead calm*" to the average man) is more than sufficient to induce a steady, adequate flow of air through

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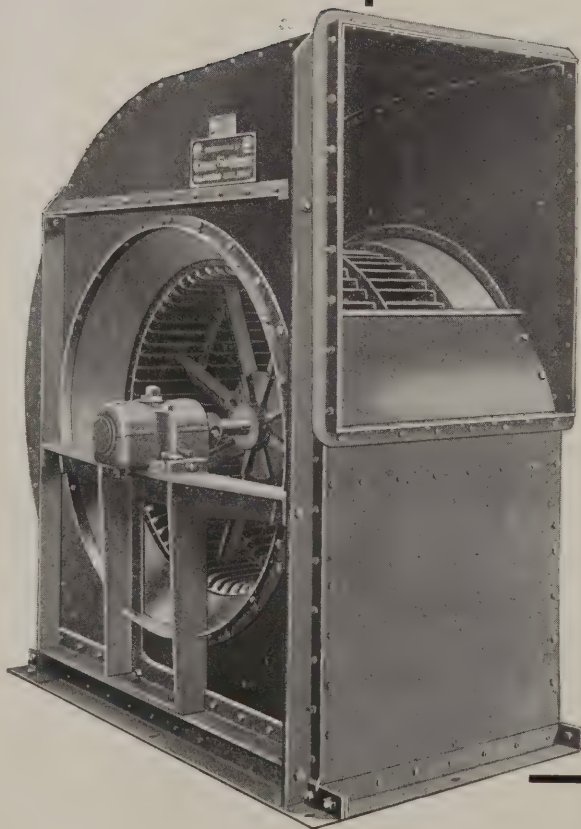
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(REG. U. S. PAT. OFF.)

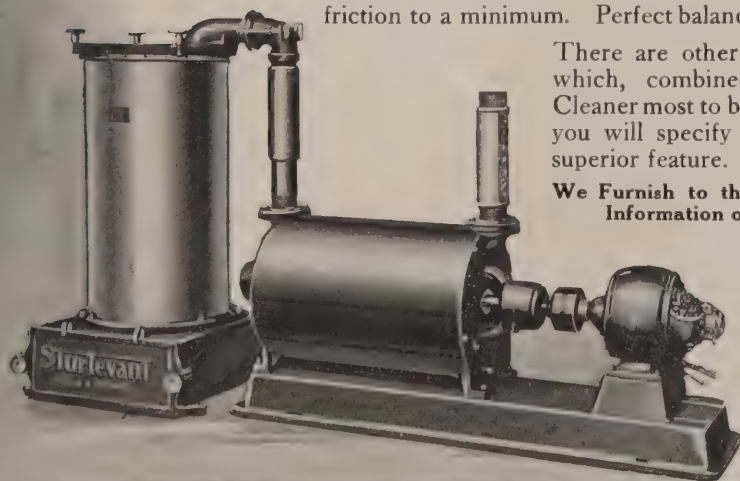
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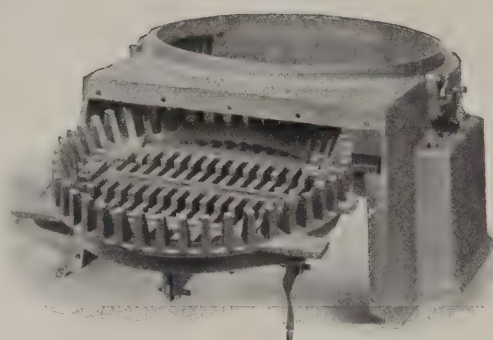
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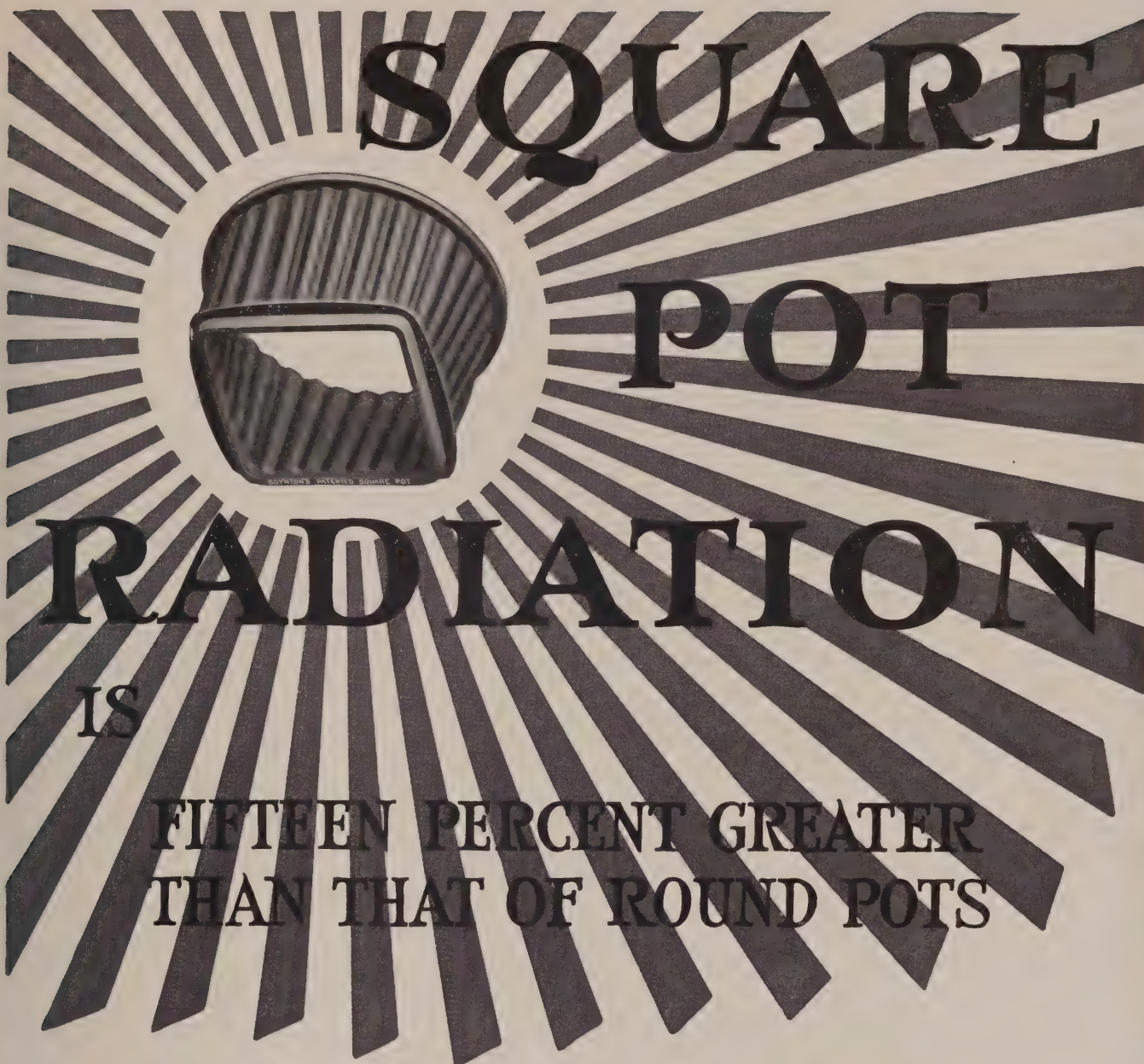
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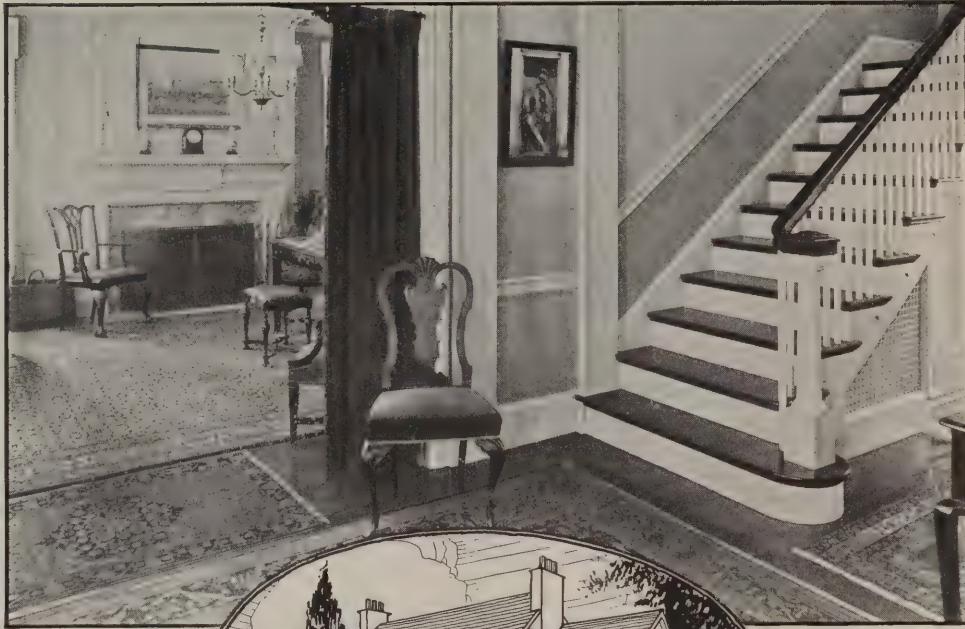
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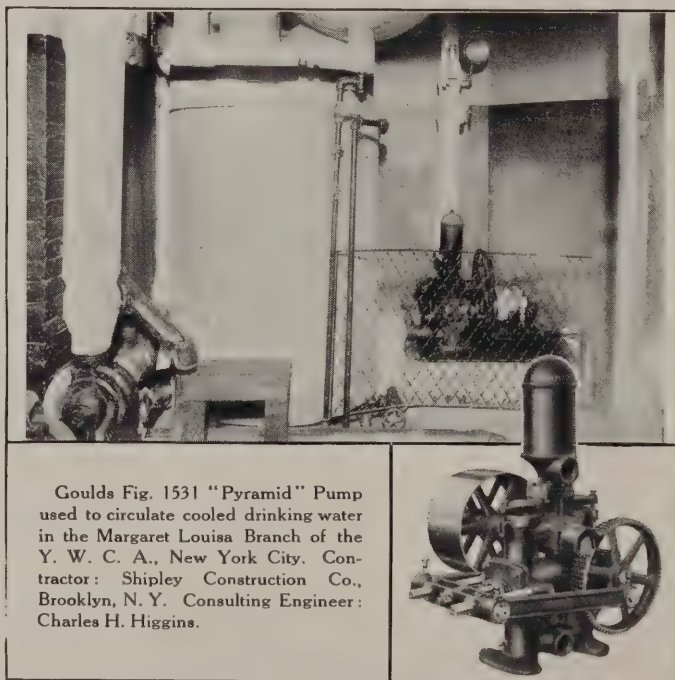
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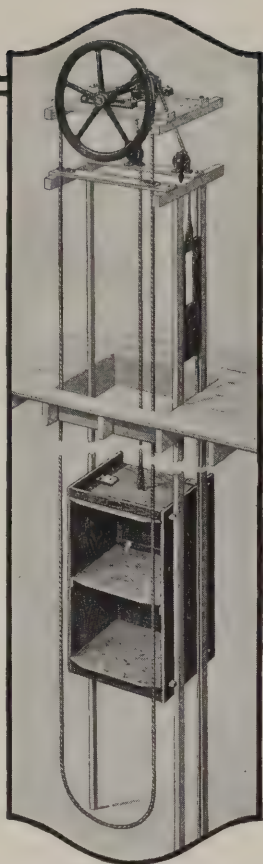
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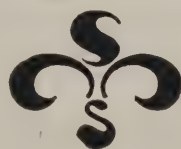
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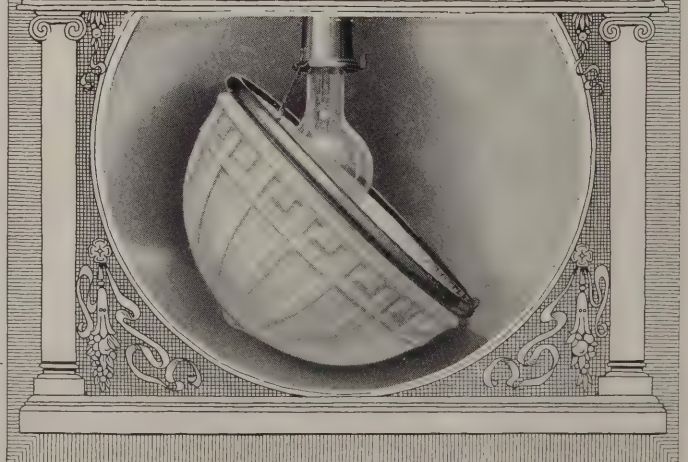
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The new things in the "Regent" line are never copies. They are never commonplace. The beautiful "Rozelle" Color Decorations were originated by "Regent." Now comes "Ivre" — a warm ivory-tinted glass unlike anything you have ever seen. Upon this are applied "Rozelle" patterns of daring originality. No picture or description can convey their charm. May we send a catalog and tell you where you can see the glass? IVANHOE-REGENT WORKS, of General Electric Co., Cleveland, Ohio.

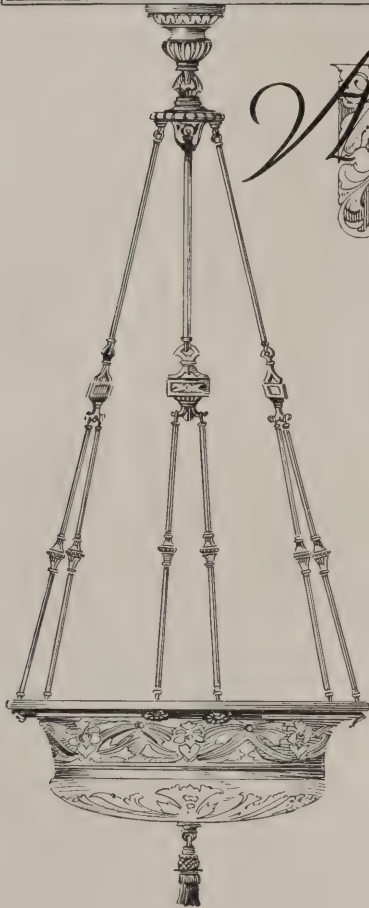
*For all Canadian business refer to Canadian  
General Electric Co., Limited, Toronto, Ont.*



# X-Ray Lighting

from Concealed Sources

*A few recent installations of  
X-Ray lighting now in  
course of completion—*



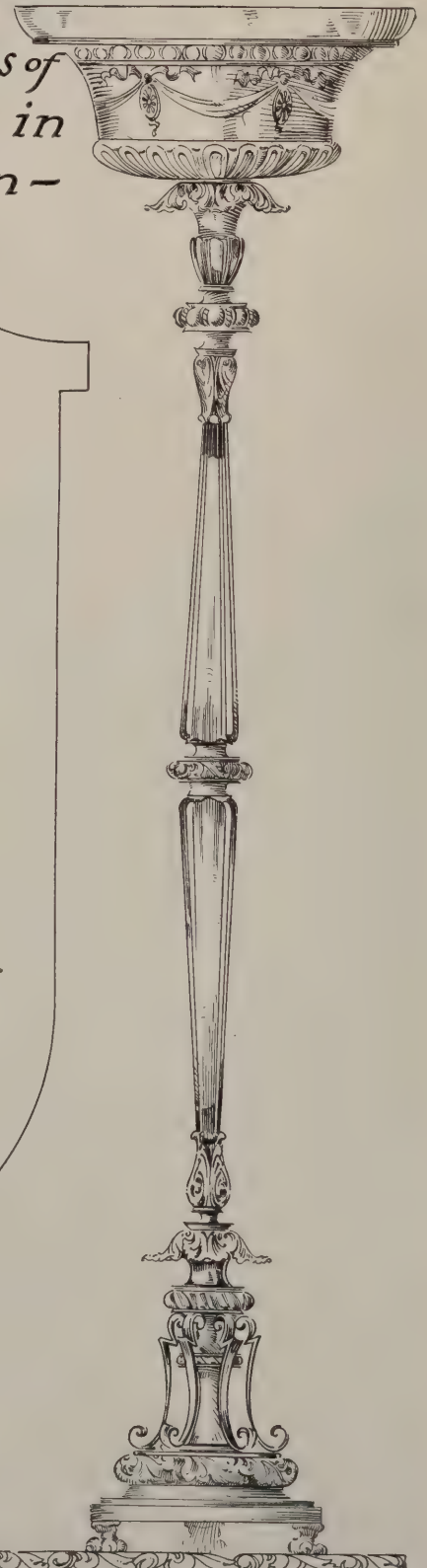
**T**HOSE who  
investigate  
find X-Ray Light-  
ing constantly in-  
creasing its field  
of application.

American Express Company  
New York City  
Renwick, Aspinwall & Tucker, Architects  
Number of Lighting Units 1350

The Detroit Daily News  
Detroit  
Albert Kahn, Architect  
Number of Lighting Units 500

Municipal Gas Company  
Albany, N. Y.  
Marcus T. Reynolds, Architect  
Number of Lighting Units 425

Minneapolis General Electric Co.  
Minneapolis  
Vaughn & Meyer Co., Engineers  
Number of Lighting Units 225

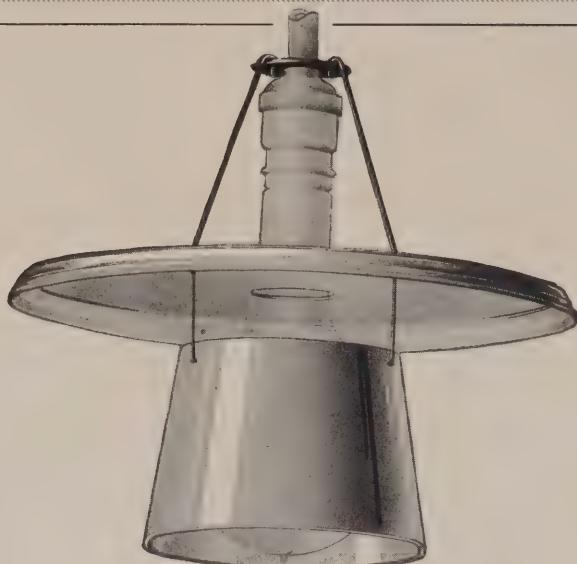


**National X-Ray Reflector Co.**

31J West 46th Street  
NEW YORK

243 West Jackson Boulevard  
CHICAGO





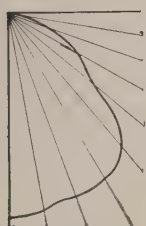
Patents Pending

## Diffused and Reflected Light for Industrial Service

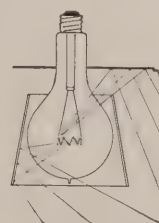
# INDUSTROLITE

The Industrolite is composed of two elements: an upper reflector of white porcelain enameled steel with a lower reflecting cone of same material suspended in such manner that all light above the angle of 40 degrees is intercepted and reflected to the working plane. The lower portion of the bulb is exposed for direct illumination to the working plane.

Dust-proof fixture — no breakage — proper ventilation — low drop in efficiency under the most severe factory conditions. Made in all sizes to accommodate lamps ranging from 100 to 500 watts.



Characteristic  
distribution  
of light



Practically every  
ray of light is  
utilized

*The services of our engineering department are at your call*

**LUMINOUS UNIT COMPANY, St. Louis, U. S. A.**

New York  
30 Church Street

Chicago  
19 South Fifth Avenue  
Philadelphia, 1007 Land Title Building

Boston  
Old South Building

San Francisco  
132 Lick Building

Canadian Distributors: Northern Electric Co., Ltd.

**Industrolite Increases Safety and Production —  
Decreases Accidents and Costs**



## A Prominent Room in the St. Louis Hotel Statler

has been thoughtfully provided with an Antique Chimneypiece reproduced from an original in the Palace Arezzo, Italy, from the

*Jacobson & Company Studios*

Wherever Jacobson Mantel or Ceiling reproductions are found, a distinctiveness prevails that is certain to impress.

Many Architects believe that a hostelry of their planning is incomplete unless the exclusive features of the Jacobson Studios are specified for one or more rooms.

The Chimneypiece shown hereon, reproduced with all its marks of antiquity, is French Gothic. It fittingly represents the wonders of the medieval age.

We invite correspondence from Architects. Acquaint us with your *special needs* in the line of Ceilings, Chimneypieces or Interior decoration of any period. We are prepared to meet each and every demand. *We ask a call at our Studios.*

**JACOBSON & COMPANY**

*Modelers, Designers and Plasterers*

241 East 44th Street

New York City

## The Ehrich Galleries

Dealers in "Old Masters" Exclusively

707 FIFTH AVENUE, at 55th Street, NEW YORK



"WILLIAM, PRINCE OF ORANGE," BY LOUIS MICHEL VAN LOO



## America's Oldest Pencil Factory

*Pride* in the achievement of a high ideal is justifiable.

It is with pardonable *pride* that we direct attention to the *result* of nearly sixty years of earnest endeavor to create a product that is the *Ultima Thule* of pencil perfection.

## The Van Dyke Drawing Pencil

(Symbol of Quality)

In 16 degrees — 6B softest to 8H hardest

Hexagon — Yellow Polish

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**NEW YORK**



# CHASE MOHAIR VELVETS

*Made by Sanford Mills*

*Upholstery of Rose Lorraine,  
one of the many Chase Mohair  
Velvets,—in use at the Hotel  
Astor, New York.*



*Leaders in Manufac-  
turing since 1847.*

**L. C. CHASE & CO., BOSTON**  
NEW YORK      DETROIT      CHICAGO

*America's Pioneer  
Plush Makers.*





## Important to Architects

However excellent the plans you have drawn may be, the home or apartment building or hotel which you have designed will not, if inferior plumbing ware goes into it, do you proper credit.

This makes it important that you specify

### KOHLER WARE

*always of one quality—the highest*

*"It's in  
the  
Kohler  
Enamel"*

*One-piece* construction, hygienic designs and the beauty of the enamel are some of the features that contribute to the excellence of KOHLER WARE.

Our trade-mark, permanent in the enamel of every KOHLER product is a guarantee of *first quality*.

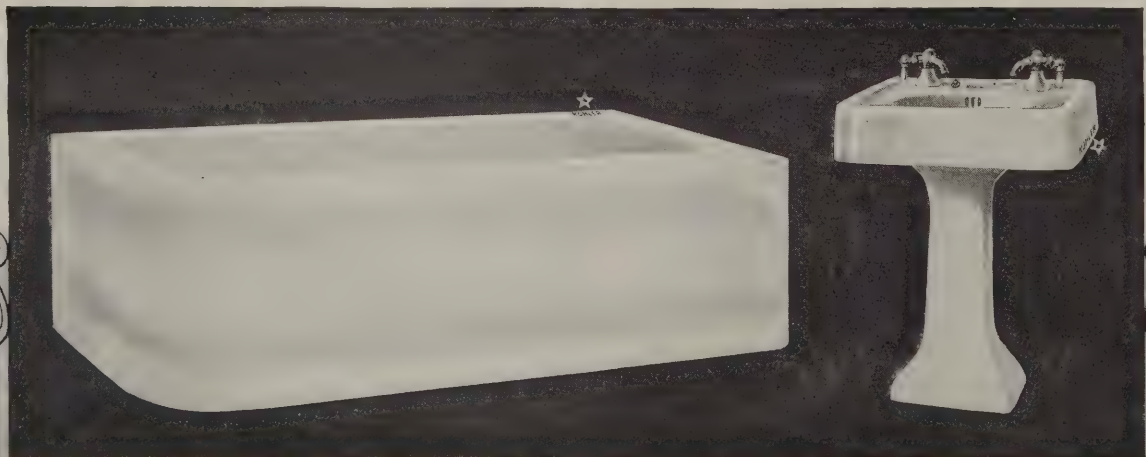
Where built-in tubs are called for specify "Viceroy." Manufacturing economies enable us to maintain a low price on this remarkable *one-piece*, all-over enameled tub.

We make KOHLER Bath Tubs, Lavatories and Sinks—always of the highest quality—to suit homes of all types.

**KOHLER CO.,** *Founded 1873* **Kohler, Wis.**

Boston    New York    Philadelphia    Pittsburgh    Detroit    Chicago    Indianapolis  
St. Paul    St. Louis    Houston    San Francisco    Los Angeles    Seattle    London

★ The star indicates the location of the KOHLER permanent trade-mark in faint blue



"Viceroy" V-12 (Patent Applied For)

Columbia Lavatory, K-205A





Nonpareil Cork Tiling in Billiard Room of Hotel Statler, Cleveland, Ohio

## The Hotels Statler — and Nonpareil Cork Tiling

Because of its many advantages, Messrs. George B. Post & Sons, Architects, of the Hotels Statler in Cleveland, Detroit and St. Louis, have made extensive use of

# Nonpareil Cork Tiling

(Trade Mark)

THE IDEAL FLOOR

in each of these buildings.

Its durability, silence, ease under foot, sanitary and fire-retarding qualities, and beautiful appearance make Nonpareil Cork Tiling particularly suitable for floors, in hotel corridors, billiard rooms, grill rooms, elevators, Turkish baths, laundries, offices, working spaces back of bars and stands, etc. In the newest and most prominent hotels, Nonpareil Cork Tiling set flush with the marble, terrazzo, or tile border in the corridors has replaced carpet. It is practically as quiet as carpet, far more sanitary, much more durable, and has a substantial and artistic appearance.

Some of the prominent hotels in which Nonpareil Cork Tiling has been installed are:

Manhattan, New York  
Knickerbocker, New York  
St. Regis, New York  
Belmont, New York  
Astor, New York  
Vanderbilt, New York

Ritz-Carlton, New York  
Martha Washington, New York  
Biltmore, New York  
McAlpin, New York  
Fort Pitt, Pittsburgh  
Gibson, Cincinnati  
Iroquois, Buffalo

Claypool, Indianapolis  
Fontenelle, Omaha  
Dyckman, Minneapolis  
Sherman, Chicago  
Kaiserhof, Chicago  
Severin, Indianapolis

Nonpareil Cork Tiling owes its durability, silence, and ease under foot to the inherent qualities of its sole constituent — cork. The tiling is furnished in three beautiful shades of brown and various sizes and shapes, making possible an almost endless number of artistic combinations. A number of these patterns are shown in the book of designs, which will be sent on request. Others will suggest themselves to you as you read.

*Samples, also, if you wish them*

**DAVID E. KENNEDY, INC., 55 Fifth Avenue, NEW YORK CITY**

*Branches at*

1524 Chestnut Street, Philadelphia, Pa.  
176 Federal Street, Boston, Mass.

Rand-McNally Building, Chicago, Ill.  
304 University Street, Montreal, Que.

Sharon Building, San Francisco, Cal.  
518 Colorado Building, Washington, D.C.

DISTRIBUTORS FOR ARMSTRONG CORK COMPANY

## The Trenton Potteries Co. Bathrooms of Character

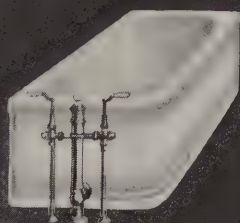
**It  
Makes  
No Noise**



2612



2110M



2022M



2050M

### PERMANENCY

in plumbing fixtures is not denoted by a white surface, but by what material is beneath that surface and how conscientiously it is made.

### The Trenton Potteries Co. "Bathrooms of Character"

are the highest development of the potter's art. The ware made basically from clay, with its highly glazed surface, admittedly has no equal.

You will never find indifference to details, skimping of baking processes or laxity in glazing the trade-marked, guaranteed products of this company.

Architects who test by use continue the specification of our goods. They like the absolute assurance that goes with "The Star Within the Circle" trade mark.



**The Trenton Potteries Company**  
Trenton, New Jersey, U.S.A.

*World's largest makers of fine quality all-clay plumbing*



# BYERS

## *The Law of Averages*

The life of water, gas and steam pipe depends on the service conditions and the kind of material from which the pipe is made. While service conditions vary, nothing is more certain than the proposition that some metals have a greater life than others.

The question as to which kind of pipe to buy, therefore, resolves itself into an equation between relative price and relative life.

The relative life of iron, steel and brass pipes can, by applying the law of averages, be as definitely ascertained as has been the life of man by life insurance statisticians.

A small beginning has been made by the A. M. Byers Company by a systematic investigation of hot and cold water pipes in 125 apartment buildings. All the information obtained in this investigation has just been published and can be obtained by asking us for

### Bulletin No. 30

These records are of the greatest value, being almost universal in application. Much other information is also contained in this Bulletin, for instance :

1. Analysis of city water in New York, Cleveland, Pittsburgh, Cincinnati, St. Louis, Atlanta and other large cities.
2. Rusty water and how to avoid it.
3. Experience with rust-filters.
4. How to lengthen life of hot water pipes.

*Send for your copy now*

**A. M. BYERS COMPANY**

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**PITTSBURGH, PA.**

NEW YORK CHICAGO BOSTON  
HOUSTON LOS ANGELES

**BYERS GENUINE PIPE**  
TUBING, CASING, LINE PIPE AND DRIVE PIPE  
BLACK AND GALVANIZED  
A. M. BYERS COMPANY  
PITTSBURGH, PA.  
ESTD. 1864  
1000 BRADLEY ST.  
PITTSBURGH, PA.

BULLETIN No. 30

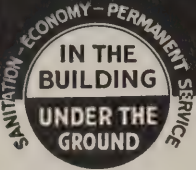
### *An Investigation of Pipe Corrosion*

Showing service records of iron,  
steel and brass pipe used for  
hot and cold water supply lines  
in 125 Pittsburgh Apartment  
Buildings.

by Thomas F. Paync  
Sanitary Engineer, formerly Instructor in  
Plumbing, Carnegie Technical Institute  
and Superintendent Specialty Department  
Standard Sanitary Manufacturing Co.



# — there's nothing like **CAST IRON SOIL PIPE** for all House Drainage



Specifications and literature will be mailed upon request by any or all of the following independent and competing makers of Cast Iron Soil Pipe and Fittings

National Pipe & Foundry Co.,  
Attalla, Ala.  
Reading Foundry & Supply Co.,  
Reading, Pa.  
Salem Brass & Iron Mfg. Co.,  
Salem, N. J.  
Sanitary Company of America,  
Linfield, Pa.  
Somerville Iron Works,  
New York, N. Y.  
Standard Foundry Co.,  
Anniston, Ala.  
Superior Mfg. Co.,  
Bessemer, Ala.  
Union Foundry Co.,  
Anniston, Ala.  
Weiskittel & Son Co., A.,  
Baltimore, Md.  
Wetter Mfg. Co., H.,  
Memphis, Tenn.  
Abendroth Brothers,  
Port Chester, N. Y.  
Alabama Pipe & Foundry Co.,  
Anniston, Ala.  
American Foundry & Pipe Co.,  
Penns Station, Pa.  
Anniston Foundry Co.,  
Anniston, Ala.  
Bessemer Soil Pipe Co.,  
Bessemer, Ala.  
Campbell Mfg. Co.,  
Gadsden, Ala.  
Casey-Hedges Co., The,  
Chattanooga, Tenn.  
Central Foundry Co.,  
New York, N. Y.  
Charlotte Pipe & Foundry Co.,  
Charlotte, N. C.  
Coosa Pipe & Foundry Co.,  
Birmingham, Ala.  
Crown Pipe & Foundry Co.,  
Jackson, Ohio.  
Gadsden Pipe Co.,  
Gadsden, Ala.  
Haines, Jones & Cadbury Co.,  
Philadelphia, Pa.  
Johnson Co., J. D.,  
New York, N. Y.  
Krupp Foundry Co.,  
Lansdale, Pa.  
Medina Foundry Co.,  
Medina, N. Y.  
National Foundry Co. of N. Y.,  
Brooklyn, N. Y.

## Several Good Points To Remember —

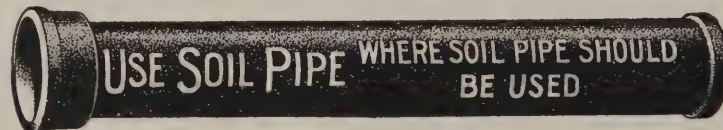
The earliest "CAST" IRON PIPE is to-day in service and is *as good as new*. This cannot be said of any other pipe.

"CAST" IRON SOIL PIPE in all house drainage is the most economical.

"CAST" IRON SOIL PIPE has an unequaled record for sanitary service.

"CAST" IRON SOIL PIPE gives permanent and unfailing service.

"CAST" IRON SOIL PIPE lasts longer than the building — *any building*.



**Use CAST IRON SOIL PIPE**  
for SOIL LINES VENT LINES  
LEADER LINES WASTE LINES

No corrosion — No menace of leaking sewage and sewer gases — No tearing out of floors and walls after pipe is installed

**Use CAST IRON SOIL PIPE**  
for HOUSE DRAINS HOUSE SEWERS

No pollution under cellars — No stoppage by tree roots — No danger of breakage by jar or settlement — No costly replacements

A-1033







MICHIGAN CENTRAL R. R. STATION  
DETROIT, MICHIGAN  
(ERECTED 1911-12)

Architects—Warren & Wetmore, New York  
General Contractor—George A. Fuller Company, Chicago, Ill.

Plumbing Contractor—John Degnan Company, Chicago & Detroit  
Heating Contractor—Hanley-Casey Company, Chicago, Ill.

Another "NATIONAL"ized Building—(See Following Page)

# "NATIONAL" Pipe in Large Buildings



## Michigan Central R. R. Station Detroit, Michigan



¶ Less than fifty years ago the railroad station was sternly utilitarian. Today architects of international reputation are engaged to design great terminals—wonderful structures which fulfill every demand of utility, yet are an architectural adornment to the cities where located.

¶ Since early in the year, many large buildings in which "NATIONAL" Pipe has been used have been illustrated in colors in this magazine. Each has demonstrated the wonderful advance made in recent years in a particular type of building—office building, store, bank, factory or school.

¶ This month the Michigan Central Railroad Station, one of the fine examples of the modern railroad terminal and office building combined, of which the city of Detroit is justly proud, has been chosen to demonstrate architectural advancement in this type of "NATIONAL"ized building.

¶ "NATIONAL" Pipe was specified and installed in the plumbing and heating systems.

¶ This is another notable evidence that "NATIONAL" Pipe is specified and is suitable for every type of large building.

Complete information about "NATIONAL" Pipe may be found on pages 1339-1351, inclusive, of the 1917 edition of Sweet's Catalogue. This is the ninth of a series of "NATIONAL"ized buildings as follows:

### THE UNION ARCADE, Pittsburgh, Pa.

American Architect, Feb. 21st, pages 60-61.  
Architectural Forum, March, pages 41-42.  
Buildings & Building Management, May, pages 23-24.

### THE EQUITABLE BUILDING, New York, N. Y.

American Architect, March 21st, pages 19-20.  
Architectural Forum, April 1st, pages 35-36.

### CONTINENTAL & COMMERCIAL NATIONAL BANK BUILDING, Chicago, Ill.

American Architect, May 2nd, pages 21-22.  
Architectural Forum, May, pages 45-46.  
Buildings & Building Management, June, pages 23-24.

### HOTEL TRAYMORE, Atlantic City, N. J.

Architectural Forum, June, pages 39-40.  
Buildings & Building Management, July, pages 23-24.

### JOHN WANAMAKER COMPANY BUILDING, Philadelphia, Pa.

Architectural Forum, July, pages 33-34.  
Buildings & Building Management, August, pages 23-24.

### DODGE BROTHERS MOTOR CAR COMPANY MANUFACTURING PLANT, Detroit, Mich.

Architectural Forum, August, pages 37-38.  
Buildings & Building Management, September, pages 23-24.

### MORMON TEMPLE, Salt Lake City, Utah.

Architectural Forum, September, pages 71-72.  
Buildings & Building Management, October, pages 23-24.

### SCHENLEY HIGH SCHOOL, Pittsburgh, Pa.

Architectural Forum, October, pages 71-72.  
Buildings & Building Management, November, pages 23-24.



## NATIONAL TUBE COMPANY

General Sales Offices, Frick Building, Pittsburgh, Pa.

### DISTRICT SALES OFFICES

Atlanta Boston Chicago Denver New Orleans New York  
Philadelphia Pittsburgh St. Louis St. Paul Salt Lake City  
Pacific Coast Representatives: U. S. Steel Products Co., San Francisco, Los Angeles, Portland, Seattle  
Export Representatives: U. S. Steel Products Co., New York City

(See Preceding Page for Illustration)





SHERARDUCT was used exclusively in the Benjamin Ide Wheeler Hall, a portion of the magnificent University of California group at Berkeley, Cal.

# SHERARDUCT

*Sherardized Rigid Steel Conduit*

**National Metal Molding Co.**

Manufacturers  
Electrical Conduits and Fittings  
1113 Fulton Building, Pittsburgh, Pa.

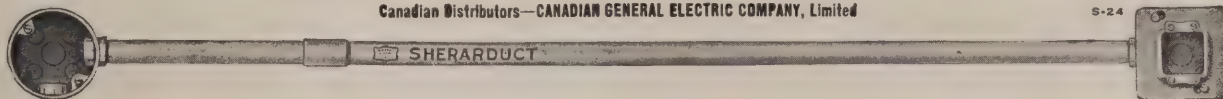
Architect  
**John Galen Howard**

Owner  
**University of California**

Electrical Contractor  
**NePage McKinney Co.**

Atlanta Boston Buffalo Chicago Dallas Denver Detroit Los Angeles New York Philadelphia Portland Salt Lake City San Francisco Seattle St. Louis  
Buenos Aires Havana Manila Paris

Canadian Distributors—CANADIAN GENERAL ELECTRIC COMPANY, Limited



## The Best Way to Prevent the Spread of Flames

is to build a fire-wall. If this wall bars progress from one section of the building to another, a door is necessary. The ideal door should be one that is light enough in weight to answer every-day purposes and at the same time possess the fire resisting qualities of the fire-wall of which it is a part.

### EVANS "ALMETL" FIRE DOORS (Pat. Pending)

have been designed and constructed with this one idea in view.

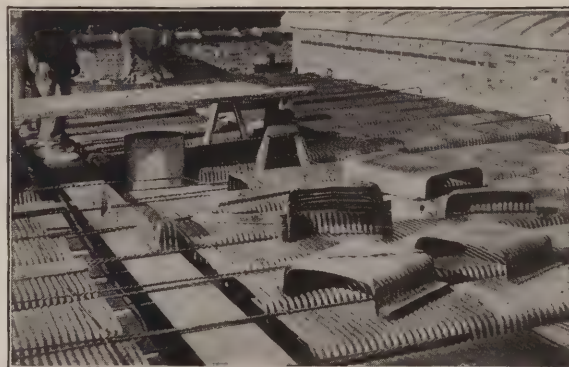
All-steel and asbestos construction, light in weight and will positively prevent the spread of flames through fire-wall openings.

Fully approved by

Underwriters' Laboratories, Chicago; Factory Mutual Laboratories, Boston; National, State and Municipal Authorities

**MERCHANT & EVANS Co.**

NEW YORK PHILADELPHIA WHEELING  
BALTIMORE ATLANTA CHICAGO  
CLEVELAND ST. LOUIS  
KANSAS CITY



## Simplify Construction

WITH the shortage of labor, the use of time and labor saving construction materials is more important than ever.

Concrete floors can be laid quickly and economically by the use of

### Berger's Pressed Steel Cores

because they require only the simplest and most inexpensive form work—a factor which makes a decided saving in the cost of a job.

The light weight of the core floor also means a reduction in the size of girders, columns, footings and walls, and a saving in reinforcing bars for all parts of the structure.

See Sweet's, page 195

**The Berger Mfg. Co., Canton, O.**



Branches: Boston New York Philadelphia Chicago  
St. Louis Minneapolis San Francisco  
Export Department: Berger Building, New York City, U. S. A.





## Protection *Against* Fire and Storm

Specify Wright Wire Lath for inside and outside use and you will give your client the protection he needs and should have.

Wright Wire Lath makes walls of permanency. When properly put up, they *stay*. The plaster holds in such a manner that storms do not tear it off. Ceilings will not sag from the action of fire and water.

The combination of Wright Wire Lath and plaster makes a hard, stone-like wall with a strong metal core. Stone and steel do not burn. This is protection far more valuable than the insurance policy that covers the house.

## Wright Wire Lath

is a *woven* fabric of cold-drawn steel wires of extraordinary tensile strength, rigidity and durability. It has a clean, even selvage that permits of easy handling and tying together. Can be attached to iron or wood furring. Can be worked around all odd shaped spaces.

*Send for Booklet L, Architect's Sheet, etc.*

**Wright Wire Co.** Worcester, Mass.

The illustration to the left shows how the plaster "keys" through to the back, when properly put on. The wire lath is completely imbedded in the plaster, making the wall solid, shock resisting, permanent.





# A Serviceable Flooring Material that Bespeaks Quality



Two views of Linotile in the New York store of John Wanamaker. The circular photograph shows it in use on stair treads; the lower illustration, on an elevator landing. In both instances the field is light gray with black fleur-de-lis and borders of light gray and black.

IN selecting a flooring material that would maintain the traditional atmosphere of the Wanamaker Establishments and yet withstand severe service, the decision of the store authorities rested on

## LINOTILE

Reg. U. S. Pat. Off.  
"The Floor That's Built to Fit the Room"

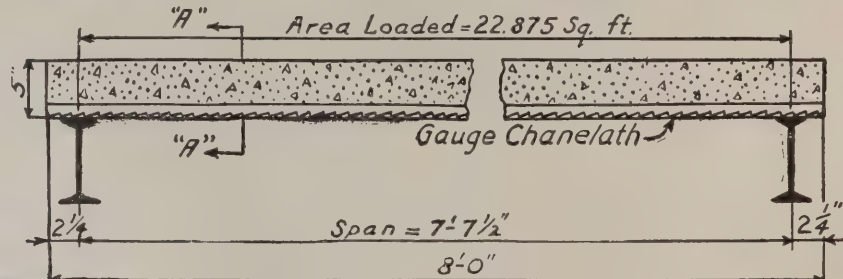
Durability and quietness were thus assured, and the artistic treatment was not confined to angles, as the graceful curve of the fleur-de-lis indicates.

These and the other advantages of Linotile should not be overlooked by architects in specifying flooring material. Whatever the artistic requirements may be, floors of correct tone and design can be devised from the eleven rich colors and the different shapes and sizes in which Linotile is made.

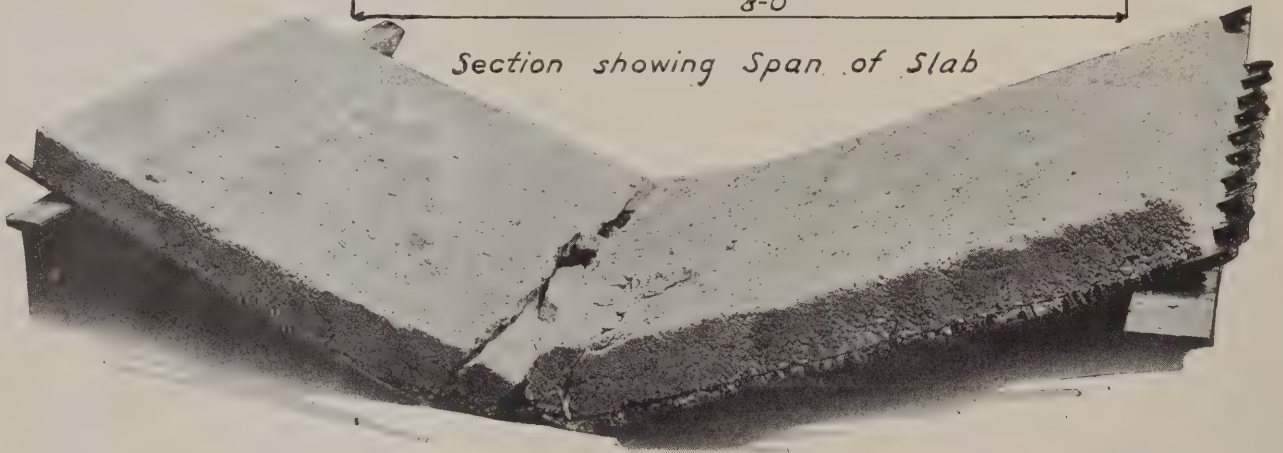
Linotile is composed of powdered cork, wood flour, linseed oil, various gums and color pigments. That you may fully appreciate its possibilities, literature and samples will be cheerfully sent on request.

Armstrong Cork & Insulation Co., 132 Twenty-fourth St., Pittsburgh, Pa.

# Reinforcing value of "Chanelath" equals high carbon steel rods



*Section showing Span of Slab*



**T**HIS is one of three concrete slabs reinforced with "Chanelath" and tested by the Philadelphia Bureau of Building Inspection. The slab was broken by loading uniformly with billets of pig iron.

The method of failure proves that "Chanelath" develops a bond with the concrete that is sufficient to develop the full strength of the steel.

The exceedingly high unit stresses in the steel at the time of rupture—the minimum being almost 50% more than the usual ultimate strength of medium steel reinforcing rods—proving "Chanelath" to be the equal, in reinforcing value, to the best quality of high carbon steel rods.

"Chanelath" is a one-piece form and reinforcement for concrete floors and roofs.

Let us send you a copy of the "Chanelath Handbook" and a complete report of the Philadelphia Tests.

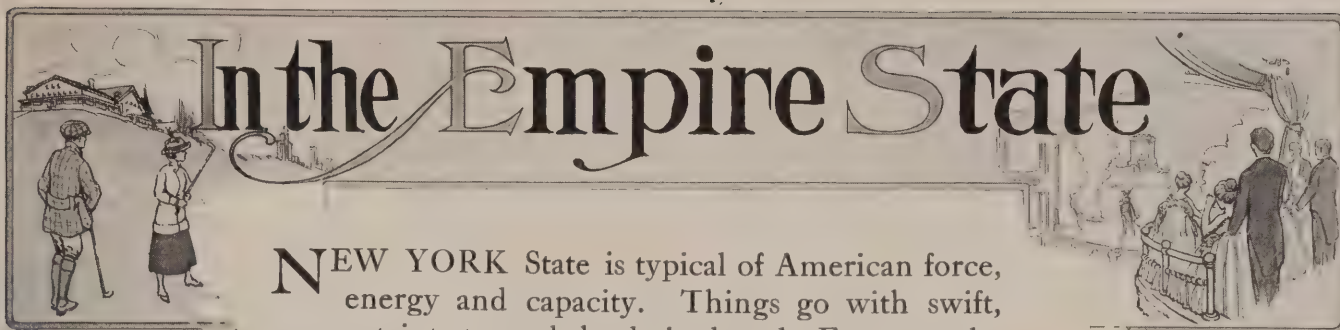
**North Western Expanded Metal Co.**

*Members of the Associated Metal Lath Manufacturers*

934 Old Colony Building

Chicago, Ill.





NEW YORK State is typical of American force, energy and capacity. Things go with swift, sure certainty toward the desired goal. For example, even the coldest winter weather is not permitted to stop building operations.

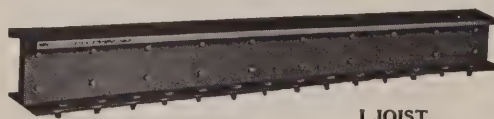
## Berger's *Metal Lumber*

(Patented)

is particularly desirable for winter building as it can be erected rapidly and satisfactorily any season of the year.

It is as adaptable as wood and as simple to use. The pressed steel joists and studs in connection with metal lath are adapted for fire-resisting floors, partitions, roofs, suspended ceilings, exterior walls, columns and girder covering and exterior wall furring.

Our engineering department is at your service.



1 JOIST

See Sweet's, pages 244-250  
Send for Bulletin 12-F

## The Berger Mfg. Company

CANTON, OHIO



Branches: Boston New York Philadelphia Chicago  
St. Louis Minneapolis San Francisco Los Angeles  
Export Dept.: Berger Bldg., New York City, U. S. A.

Vrooman Ave. School, Amsterdam, N. Y.; Architect, L. H. Niles



Residence of G. B. Pegram, New York City  
Architect, Wm. B. Claflin



Crouse-Ingving Hospital, Syracuse, N. Y.  
Architect, Earl Hallenbeck



Twin House, Tuxedo Park, N. J.  
Designers, Taft & Howell Co.



Sage Foundation Homes, Forest Hills, L. I.  
Architect, Grosvenor Atterbury



Mills Hotel No. 3, New York City  
Architects, Oliver & Burr



Leavenworth Apartments, Syracuse, N. Y.  
Architect, C. E. Colton

Berger's Metal Lumber has been used in over 60 different classes of buildings in this and foreign countries.

The Twin House shown above was built in 1907 and is the first building constructed with Metal Lumber.



# Kahn Pressed Steel Construction

## Less Labor, Less Material, Yet Permanent

Conditions to-day demand that every one save labor in building and economize in materials. Kahn Pressed Steel Joists and Studs reach the job all cut and fitted ready to go into place. No riveting, no sawing, no centering, no special equipment required. Hy-Rib Metal Lath is easily attached by merely bending down the prongs in the steel members. The thin layer of concrete or plaster used on the Hy-Rib reduces the quantity of materials, the labor of placing them and the weight of the construction.

For floors, partitions and ceilings, KAHN PRESSED STEEL BEAMS provide a safe and most economical form of modern permanent construction. Its advantages include protection against fire, decay and plaster-cracking, with entire freedom from vermin.

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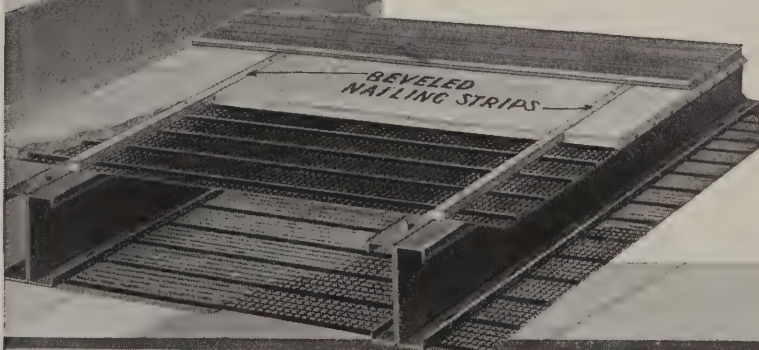
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Trussit is a corrugated steel sheet uniformly expanded in both directions. In the finished wall it is so interwoven back and forth through the cement or plaster that it is not a mere backing for the wall but an integral part of it. Uniform distribution of the metal overcomes any tendency toward expansion or contraction in any one general direction.

Trussit eliminates entirely permanent studding and permits of the erection of partitions two inches in thickness, space saving, fire-retardant, and wonderfully rigid. It forms a curtain wall equal to brick or poured concrete at a fraction of their cost.

Trussit is easily erected and plastered. The large sheets need merely be set in place, fastened at floor and ceiling; a simple, temporary bracing is placed on one side and the first coat of plaster applied. The plaster that is pushed through the Trussit forms the basis for the coat on the opposite side.

Trussit is used as a reinforcement for walls of small frameless buildings; for stucco exterior walls in wood frame structures; for stair and elevator enclosures and numberless miscellaneous fire-proofing purposes.

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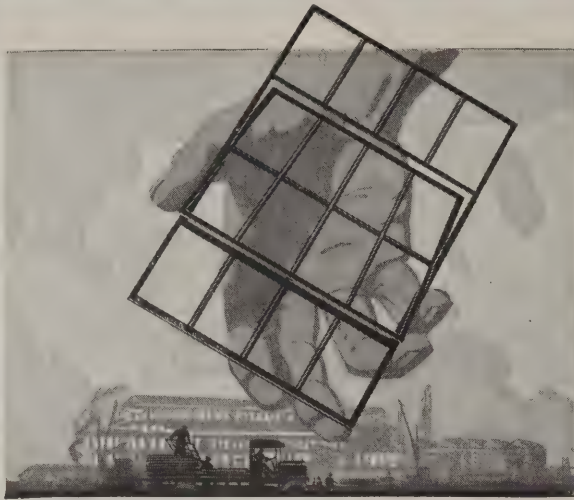
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This cross section of a partition wall shows the uniform expansion of Trussit and how it becomes actually an integral part of the wall.

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| 4' 8"           | 5' 7"           |
| 6' 23"          | 6' 10 3/4"      |
| 7' 8 3/4"       | 8' 6 3/4"       |
| 9' 3 3/8"       | 10' 3 3/8"      |
| Widths          | Widths          |
| 3' 2"           | 3' 8"           |
| 4' 2 3/4"       | 4' 10 3/4"      |
| 5' 2 3/4"       | 6' 0 3/4"       |

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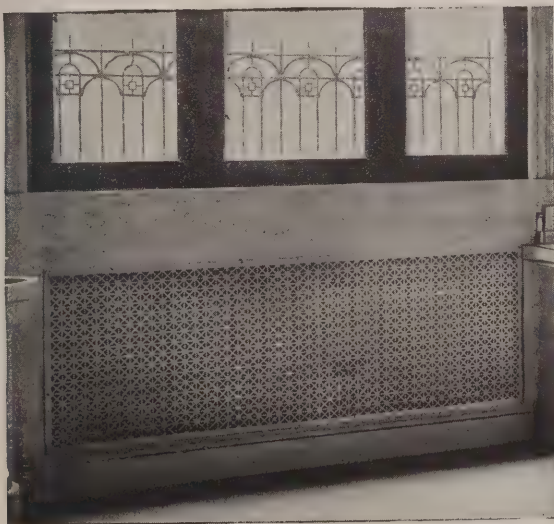
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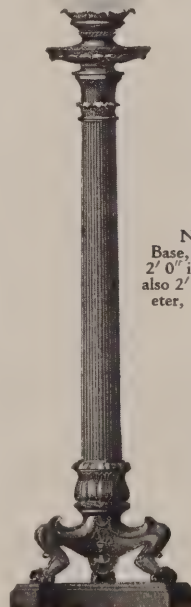
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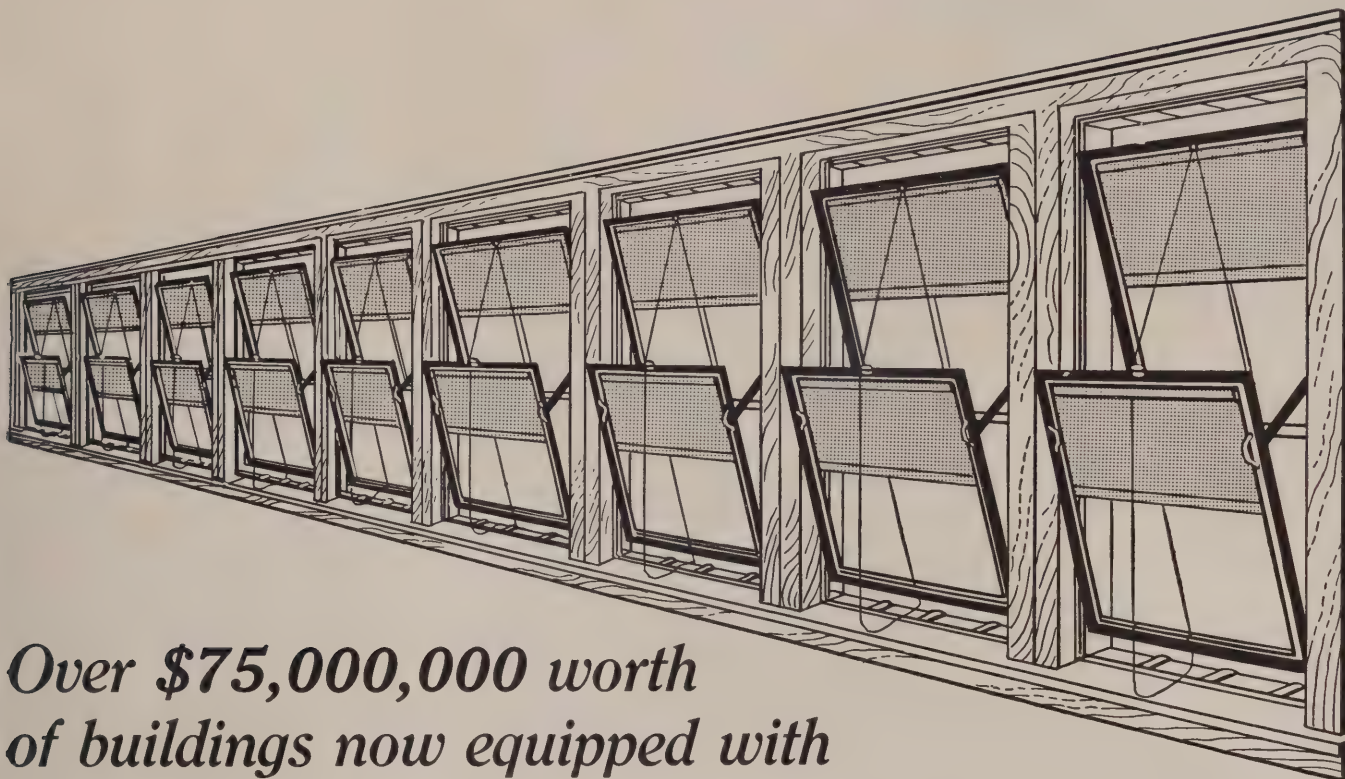
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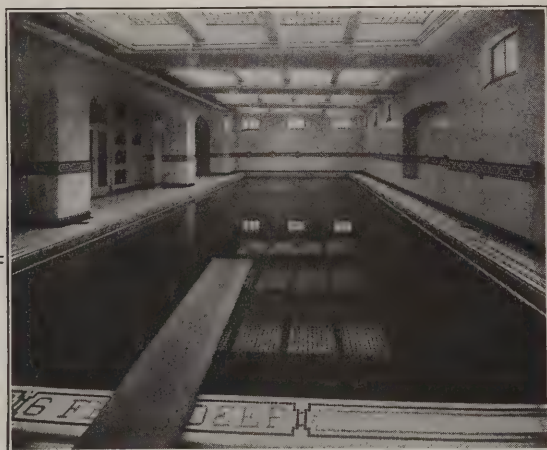
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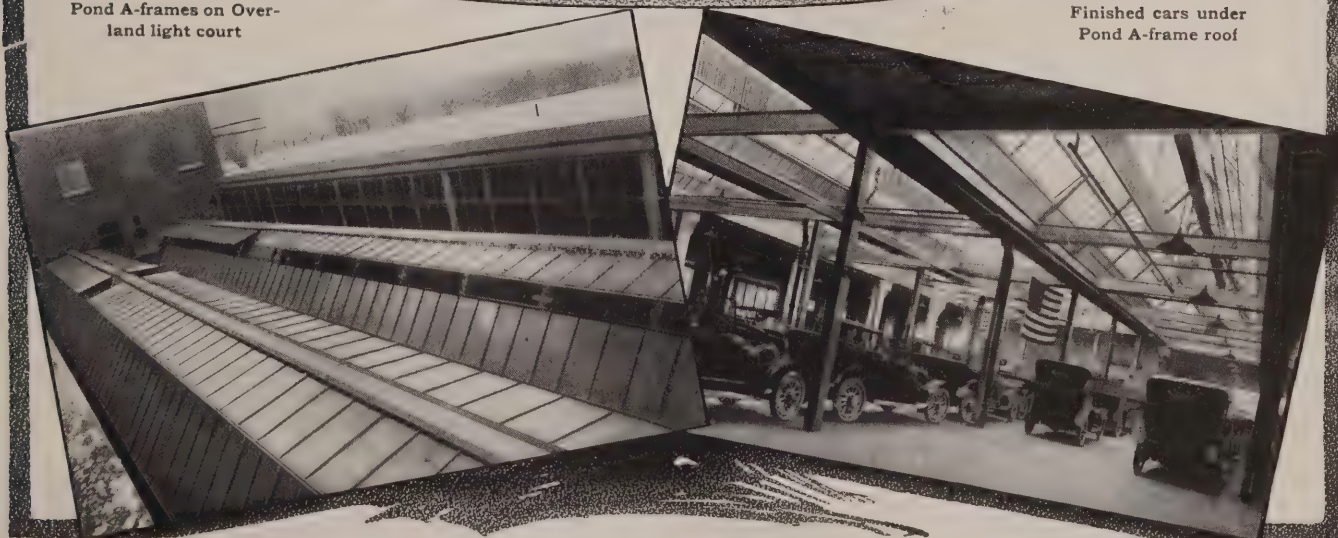
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 realizes its good glazing qualities.

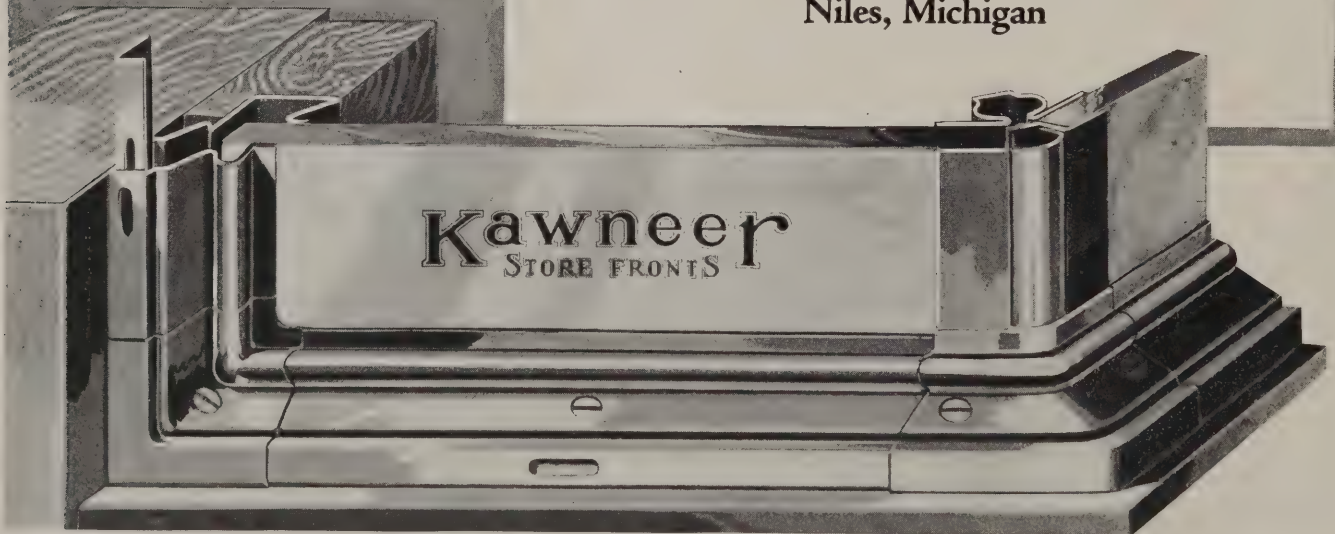
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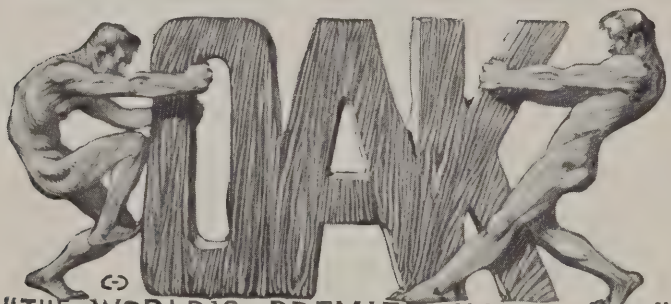
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 "Beauty is truth, Truth Beauty"  
  
 "Beauty opens Locked Doors"  
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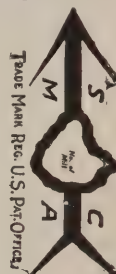


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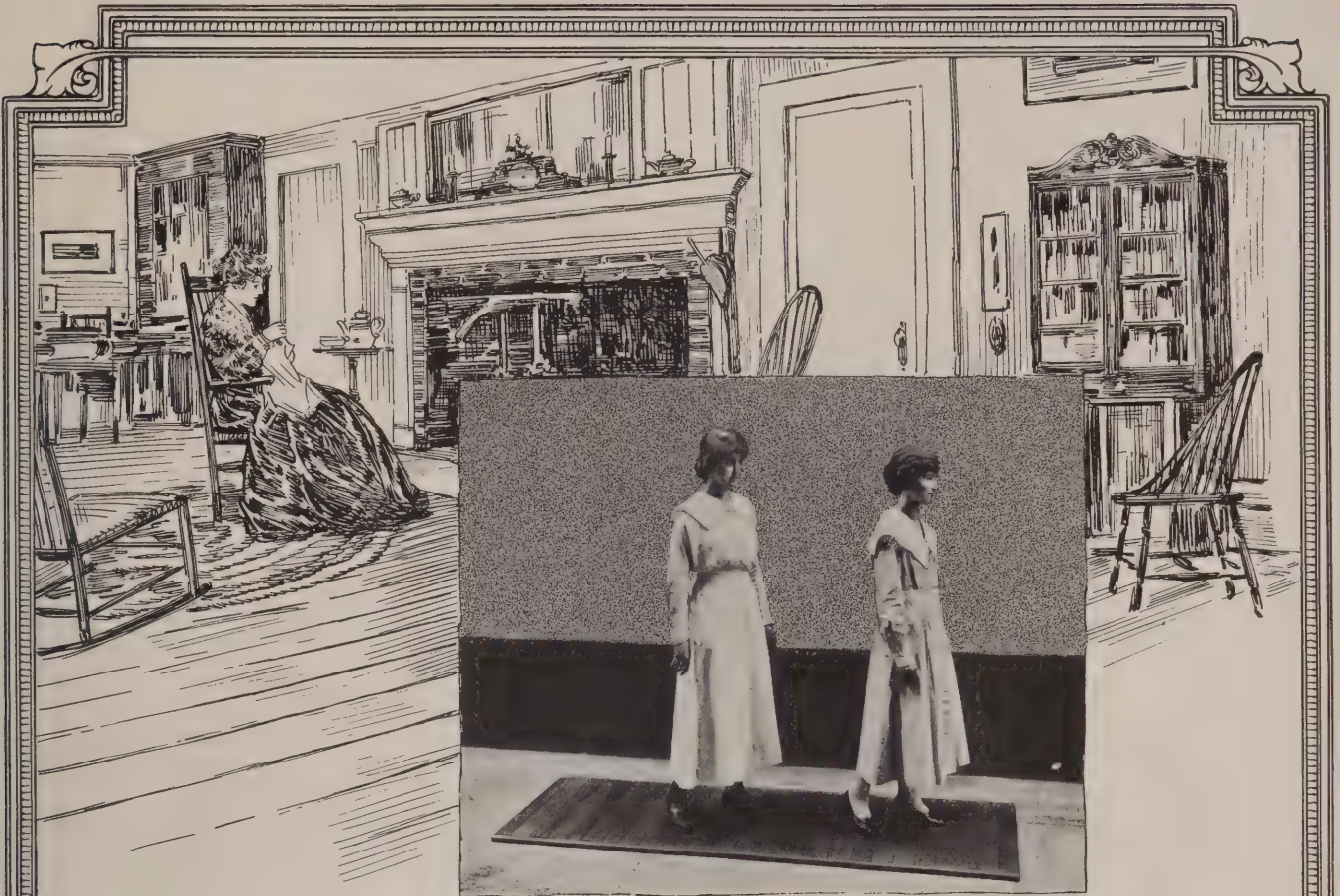
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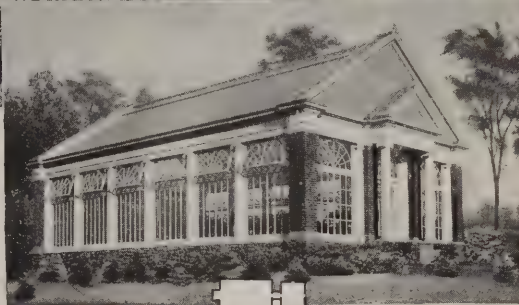
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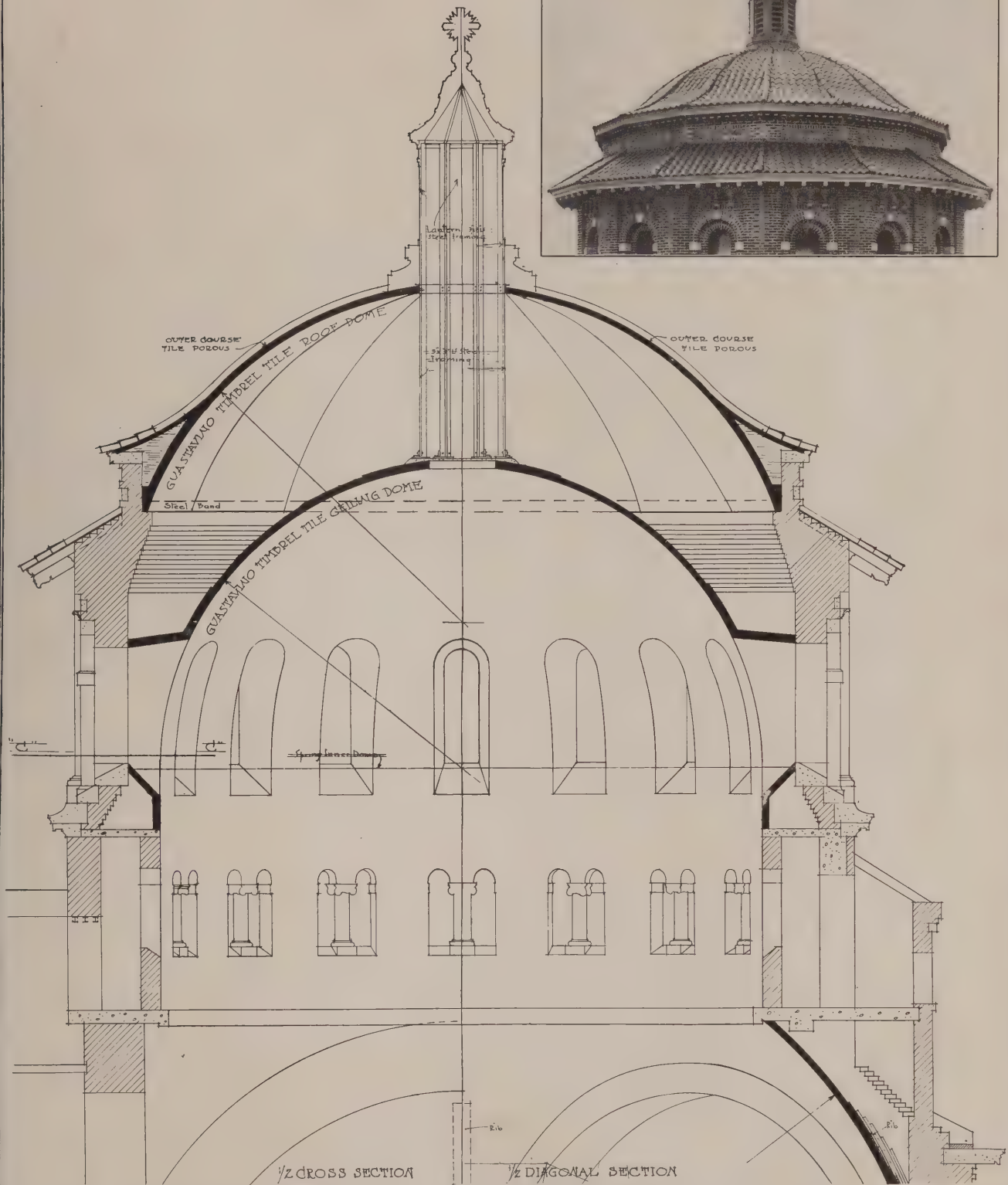
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*Detail from Apartment, Philadelphia. Frederick Webber, Architect*



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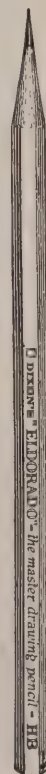
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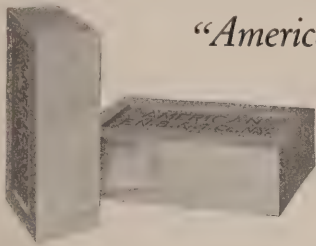
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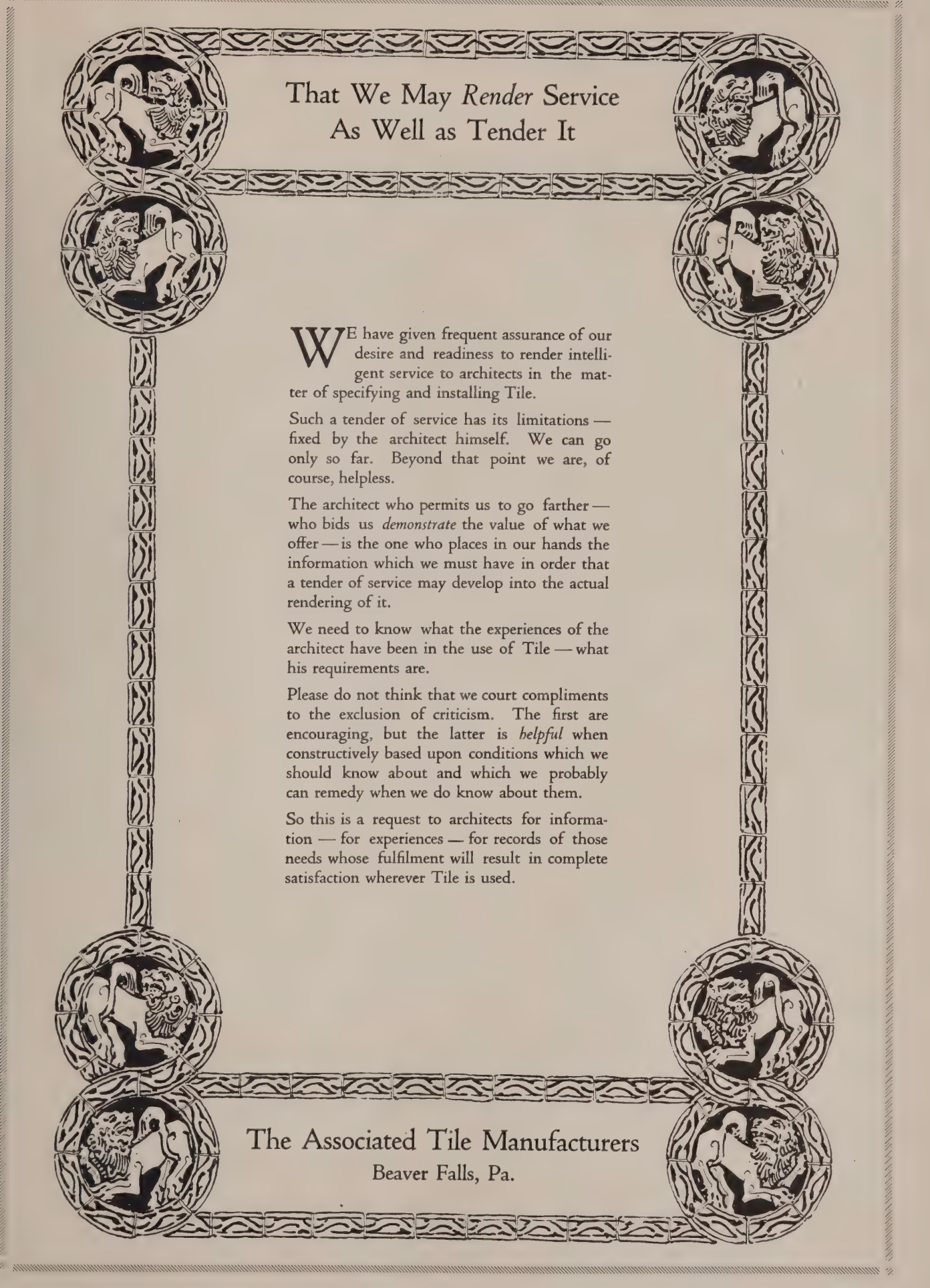
*And Principal Cities*



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VOLUME XXVII

NUMBER 6

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GATES TO INNER COURT, BURLEIGH HOUSE, STAMFORD, ENGLAND  
DESIGNED AND WROUGHT BY JEAN TIJOU



# THE ARCHITECTURAL FORUM

## FOR QUARTER CENTURY THE BRICKBUILDER

VOLUME XXVII

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### The Ironwork of Jean Tijou

#### I. HIS CRAFTSMANSHIP AT HAMPTON COURT, ENGLAND

By R. RANDAL PHILLIPS

OF some men who have played a prominent part in the world of architecture and craftsmanship we have an intimate knowledge, but John or Jean Tijou is not one of them. Of him we know very little, for he left no personal record of his life and achievements, nor had he any contemporary biographer. Many, in later days, have delved carefully into documents that might give the desired particulars, but we are still unable to say where Tijou was born or where he died; we are in complete ignorance as to his training, and though his name is associated with an entirely new manner of fashioning ironwork in England, we cannot even determine with certainty whether he was a practical smith or not. Yet, if we know so little of the man himself, we have abundant authenticated examples of his work, and these are sufficient to warrant our placing him in the forefront of craft workers.

In tracing his career it may be assumed, to begin with, that he was a Frenchman, despite the fact that the record of French craftsmanship in iron makes no claim for him. At some date, unknown, he left his native land for Holland and found employment with the Prince of Orange; but there is no definite ground for asserting that he was among those Protestant refugee artists who fled from France after the Edict of Nantes, and it is equally doubtful to assume that he was not a Protestant refugee because his daughter married Laguerre, a Roman Catholic. There would appear to be no doubt, however, that he was no mere artisan, but a man of some position and influence, such as would recommend him to the service of that prince who became William the Third of England. Daniel Marot was another artist who came over in the royal retinue from Holland and brought a new manner of design with him. There is, indeed, a resemblance between Marot's designs for ironwork and Tijou's that leaves one with the impression that Tijou was largely influenced by Marot.

The first definite date which can be set against Tijou's name is 1690, the year following the arrival of William and Mary in England, that being the date for Tijou's bill for six iron vanes and the iron-

work to the balcony of the Water Gallery at Hampton Court, which little building was specially built for the Queen's occupation while Wolsey's buildings on the east front were being pulled down and Wren's State Apartments substituted for them. From this time onward for many years the palace accounts include entries for ironwork supplied by Tijou. Hampton Court, in fact, shares with St. Paul's Cathedral the claim of possessing the bulk and the best part of Tijou's craftsmanship; but it is a curious fact that though Wren was the controlling architect in each case he makes no single reference to the designer of the ironwork, and equally strange is the fact that Tijou in the book of designs for ironwork which he published a few years after his arrival in England—ironwork supplied, for the most part, for buildings designed by Wren—makes no mention at all of the great architect. It has been assumed from this that there must have been some mutual antipathy, that Tijou's comparatively florid manner of design was not approved by Wren, and that an estrangement grew up between them; but apart from the omission of a reference on either side, there is nothing to support the assumption, and in the case of Wren, knowing the fine broad character of the man, it might well be argued that such an omission would have been too petty.

The work at St. Paul's begins with 1691 and goes on for quite fifteen years, after which time we entirely lose track of Tijou and can find no record to tell us what he subsequently did and where and when his end came.

Besides Hampton Court Palace and St. Paul's Cathedral, Tijou did ironwork at Chatsworth, Drayton House, Burleigh House, and probably a number of other country seats, while there still exists examples of his art in other buildings, like the gates to the Clarendon Press, Oxford, which may be claimed as his. All of which would lead us to assume that Tijou must have made a considerable fortune, though the point has been raised, in view of Tijou's repeated requests for payment for work carried out at Hampton Court and St. Paul's, that he spent his money as fast as he made it, leaving him in an



unfortunate financial position during his declining years.

His book of designs was published in London in 1693. On the title page it bore, in French as well as English, the following: "A new Booke of Drawings Invented and Designed by John Tijou containing severall sortes of Iron worke as Gates, Frontispieces, Balconies, Staircases, Pannells, &c. of which the most part hath been wrought at the Royall Building of Hampton Court, and to severall persons of Qualities Houses of this Kingdome all for the use of them that will worke Iron in Perfection, and with Art" — the last sentence leaving us in no doubt as to the author's own high estimate of his value. There are nineteen plates in the book, each bearing Tijou's name as designer, and Van Somer's and other artists' names as engravers, the frontispiece being engraved by Tijou's son-in-law, Louis Laguerre. There is no indication on the plates as to the buildings for which the ironwork was designed, but in the majority of cases it is easy to determine this by comparison with the executed work still existing, and in making this comparison one cannot overlook the fact that, with certain exceptions, — in particular the entrance gates at Burleigh House,

near Stamford, — there is a distinct modification in the executed work, an elimination of the overflorid, and a general simplification and improvement. There are no facts to explain this, but it may well be contended that in the case at least of Hampton Court Palace and St. Paul's Cathedral, Wren's sobering influence came into play — and it is on this hypothesis that, imagining a cause of disagreement when the architect altered the craftsman's designs, the idea of an estrangement between Wren and Tijou is supported. A study of the book of designs leads one further to the question as to what exactly were Tijou's qualifications. Undoubtedly he possessed the talents of an artist, but was he actually a craftsman, or only a designer for craftsmen? If the former, then how was it that his designs show work which it was practically impossible for a smith to execute in iron? Was that perhaps a mistake of the engraver's? These are questions that cannot be answered with certitude. The nearest approach to the truth would appear to be that Tijou was an artist-craftsman who excelled especially in embossing, and that he himself executed the finest parts of his ironwork, — such as the masks that are so distinguishing a

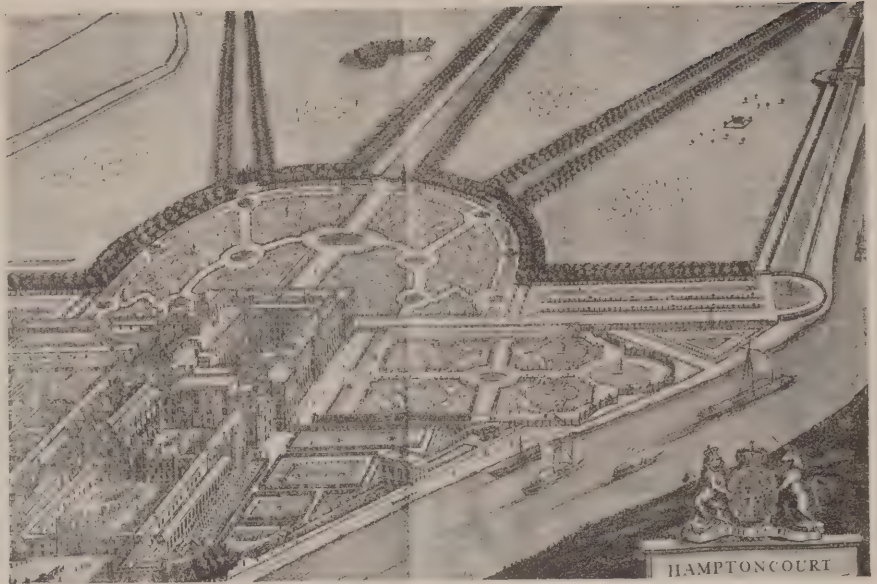


Great Gates Between Gardens and Park, Hampton Court Palace



feature, — leaving the remainder to be carried out by the men under his control. The embossing in Tijou's ironwork, as, for example, the characteristic cocks' heads in the main gates on the east front of Hampton Court Palace, or the round plaques and the scroll leafage on the choir gates in St. Paul's Cathedral, is remarkable; it has, in fact, never been excelled, and rarely equaled, in English craftwork in iron.

At Hampton Court Palace, Tijou did an enormous amount of work, chief among which are the gates to the central entrance on the east front, the splendid balustrading to the King's and the Queen's staircases, and the celebrated screen in the gardens. This last has been the subject of much contention. It now stands at the river end of the Privy Garden on the south front of the Palace, and is commonly supposed to have always occupied this position — an assumption supported by Kip's view of 1708 (here reproduced), which shows the screen in this same position. Mr. Starkie Gardner contends, however, that so important a piece of ironwork was never in-



Kip's View of Hampton Court Palace, 1708, Showing Screen in Fountain Garden, Now Privy Garden



Design for Hampton Court Screen from Tijou's Book



Panel of Screen in Privy Garden, Hampton Court Palace

tended for a comparatively unimportant place, but rather that the screen was designed and erected in the original Fountain Garden in front of the new State Apartments. He says: "The Fountain Garden was redesigned by Daniel Marot, *Architecte de sa Majesté Britannique*, and considerably enlarged in 1699, when Talman was required to make estimates for lead pipes, £987 14s, and for the outer row of eight additional fountains, and for 1,442 feet of iron rails to be done on both sides the Fountain Gardens £2,132 16s. The screen had no place in the new design and must then have been removed to the second position at the



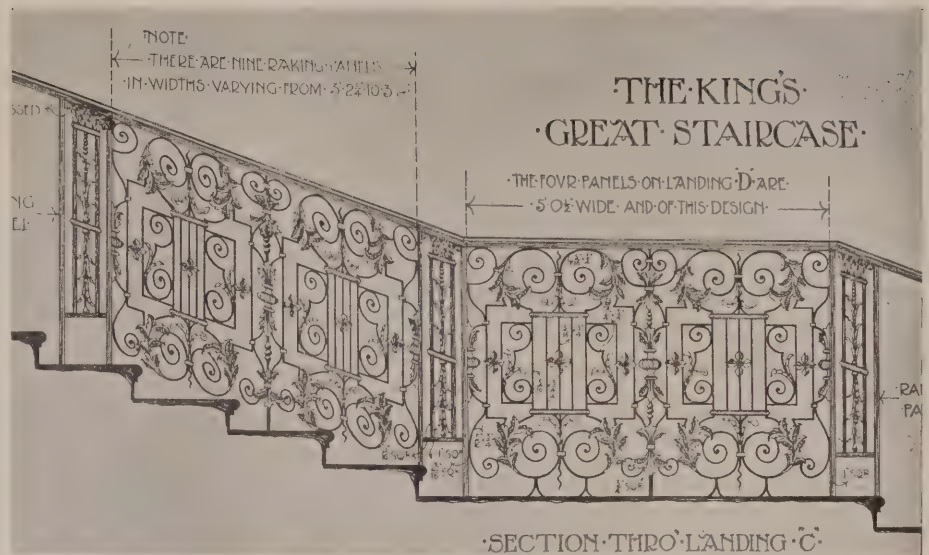


CENTER GATES, MAIN ENTRANCE, EAST FRONT HAMPTON COURT PALACE, ENGLAND

DESIGNED AND WROUGHT BY JEAN TIJOU



end of the Privy Garden, with one fountain, which extended from the south front to the river. Sutton Nicholl's engraving of 1695 makes it quite clear that it was not in the Privy Garden in 1694, when the Queen died. The great gates were not removed with the screen, but occupy in Kip's view a similar position in the new boundary line and still separating the two broad walks from their continuation as avenues in the park." The screen consisted of twelve panels about 9 feet square, separated by pilasters and having gates at the center. It was taken back to the Fountain Garden in 1736 and afterward fell into a bad state of repair. In 1865 the panels were removed to South Kensington and distributed to various museums, but ultimately they were brought again to Hampton Court and set up in the Privy Garden. In the course of these wanderings the ironwork was considerably restored, but the general design was preserved, and we may still see the actual handwork of Tijou in them. The gates on the east front of the palace have experienced no such treatment as the screen; they are in a protected



Tijou's Design for Hampton Court Staircase from Baily Murphy's "English and Scottish Ironwork"

position and are in an excellent state of preservation. In point of good design and fine execution, they must be counted among the very best work Tijou ever produced, especially the central pair of gates which are magnificently wrought.

The claim was made that a certain Huntington Shaw was the real designer of the Hampton Court screen, on the strength of the following inscription on a tomb in the churchyard at Hampton: "Here lieth ye Body of Huntington Shaw of Nottingham who died at Hampton Court, the 20th day of Octo-



Gates at Main Entrance, East Front of Hampton Court Palace





Details from Gate at Clarendon Press, Oxford

ber 1710 aged 51 years. He was an artist in His way, he designed and executed the ornamental Iron work at Hampton Court Palace." This claim, however, has been entirely disposed of by Mr. Garraway Rice, who made a searching examination of the matter. There is no mention of Huntington Shaw in the old Treasury Papers, although the names and wages of all the artificers engaged on the works, from the great artists, such as Cibber, Gibbons, Verrio and Laguerre, down to the commonest laborers, are frequently mentioned. "And this suspicion was confirmed when among 'A List of Debts in the Office of Works in 1701,' preserved in the Record Office, an entry was found under the heading of 'Hampton

Court Gardens,' of '£1,982 0s 7d due to John Tijou, Smith,' the conclusion being that in Tijou we must recognize the real author of these magnificent works of art." It was this search that, incidentally, led to the discovery of Tijou's book of designs which effectually disposed of the claim made on behalf of Huntington Shaw, while a close inspection of the inscription on the tomb revealed the fact that the last words, "he designed and executed the ornamental Iron work at Hampton Court Palace," were a modern addition having been done when alterations were carried out at the church in 1830. To Tijou is due, therefore, all the credit for having designed and fabricated the Hampton Court ironwork.



Detail of Center Gates, East Front of Hampton Court Palace



# Industrial Housing

## NOTES ON THE SIXTH ANNUAL CONFERENCE OF THE NATIONAL HOUSING ASSOCIATION — Concluded

By CHARLES C. MAY

IN the interest of simplification we have taken some liberties in considering certain papers outside their actual order on the program. Thus, Mr. Allen's talk on cheapening the workman's house has been reserved to be taken up with other papers relating to the individual house and its construction. Leading to such consideration, Mr. Magnusson's paper on "What Employers Have Done to House Their Employees in the United States" packed into small space a tremendous amount of information. It presented in condensed form some of the results obtained by the U. S. Bureau of Labor Statistics during a year's investigation covering coal, copper, and iron mines, steel companies, and the principal towns where are located the great plants for the manufacture of textiles and explosives. In all, the inquiry covered 213 companies, employing in the aggregate very nearly a half million workers.

He placed the first small beginnings of industrial housing as contemporaneous with the rise of the factory system; such beginnings, for example, as are marked by the dates 1791, at Paterson, N. J., and 1820, at Lowell, Mass.

With all its marvelous progress, town-planning has not even yet become the rule in industrial developments, though more frequently evidenced among factories than in mining settlements. An absence of restrictions, the inevitable tendency toward uniformity, a lack of growing things, and a standardization of types are the outstanding characteristics of these developments as a whole.

Classifying the entire number of dwellings considered (53,176 in all), it was found that frame construction predominates, two wooden houses to every one of brick, the nearest competitor; four-room houses predominate over five and six room at the same rate, and the relation is nearly so for single houses over double and row or terrace groups. It may, perhaps, cause surprise to hear that almost 70 per cent of all these houses rent for less than \$8.00 per month, but certainly not to know that in only two villages were vacant houses to be found.

Company houses include, of course, many degrees of desirability in planning and in provision for sanitary, wholesome living. We can judge somewhat of these classifications from the fact that 35 per cent of all houses under consideration were quite devoid of any modern conveniences; that 20 per cent had none except running water, and that only 15½ per cent were fully supplied with water, light, sewer connection, toilet, and bath.

Since the employer's responsibility for his work-

men's housing and social condition is more easily recognizable in mining companies than in any others, it would be expected that they would lead all classes of industry in such activities. As a matter of fact, they are surpassed by the cotton mills. At the other end of the list are the gold mines, though the reason is not altogether clear for so extreme a discrepancy between this and other sorts of mining.

In the matter of general costs of industrial developments, Mr. Magnusson cited as a fairly typical example that of a company which had housed 42 per cent of its employees at a cost which was 28 per cent of its average annual payroll for five years. A special case of another development where higher grade houses were provided with some architectural varieties and equipped with modern conveniences, showed a complete reversal of these figures—the cost was 52 per cent and the number housed, 28 per cent.

Based upon the first case, a rough working rule of thumb would state that to house all its employees a company must be prepared for an expenditure of not less than two-thirds of its annual payroll. It is fair to say, however, that this is probably considerably below the minimum for present conditions.

Returns on the company's housing investment must be correspondingly variable. They range from a maximum of 20 per cent in some southern mining communities down to 6 per cent for certain steel concerns, the percentages in both cases being gross; for eight of the coal companies reported, the average gross return was 11 per cent on a total inventory value of two and three-fourths millions. Putting the several sets of figures together, one sees the returns varying inversely with relation to provision of more than the bare essentials of housing.

General testimony from the whole list of employers brought out as conclusions: that all were satisfied with the housing experiment, though on somewhat different grounds, and sometimes in spite of its being unprofitable; they had satisfied themselves that housing of employees secures better workmen, reduces labor turnover, attracts married men rather than floaters—that it is, in short, a potent factor making for stability in the industrial relation.

The discussion of this paper drew forth further testimony to the universality of this vexed question of "turnover" in labor. Mr. Kennedy, of the Youngstown Sheet and Tube Company, stated that careful investigation over a year's period had proven that the "turnover," that is, the shifts in the payroll, owing to short terms of employment, amounted, in this concern employing 15,000 men, to 187 per

cent of the total on the payroll. This record is exceeded by other companies. Figures were quoted showing 40,000 men actually employed in order to get a continuing force of 10,000; a steel company admitted a shift of one-third of its total staff per month. Here is no sign of a loss of labor's mobility! Consider, then, the economic loss of such turnovers. The steel company quoted, calculates that it costs \$30 to place and train a man; in another class of industry the charge runs from \$20 to \$80, according to the grade of service. The next step in investigation, which as yet no one seems to have taken, would be to discover what proportion of this vast loss could be eliminated by the provision of proper housing. This yearly saving, capitalized at 5 per cent, would, we venture to prophesy, show a surprising result as to the amount that might profitably be invested in the company's housing program.

During one of the earlier discussions, Mr. Armstrong of Toronto made the assertion that no housing in England had yet reached the lowest strata of society, except insofar as, by reaching the next stratum above, it had relieved the downward pressure. Considering what we have been wont to think of England's achievements in the field of housing, such testimony inclines one to brush aside the non-essentials and to beg for a statement of the irreducible minima. For many years we have been struggling with this problem, always approaching it from the top, and always we have reached, not the man we have aimed for, but the one next higher up. Now for once, at least, let us approach from the bottom and see what may be the result.

Some such reasoning was the basis upon which was built the paper by Mr. Leslie H. Allen of Boston. He began by summarizing the prime essentials "of a modern city house" as follows:

Watertight roof, walls, and floors.

Bedroom for parents.

Bedroom for male children, if any.

Bedroom for female children, if any.

One or more living rooms for cooking, eating, and general day use.

Private toilet room with sanitary water closet and sewer connection.

Suitable heating arrangements.

Running water supply fit for drinking.

Kitchen sink with waste connected to sewer.

Uninterrupted daylight and ventilation through windows in every room.

A second list embodied features considered essential by the American family:

Cellar.

Closets.

Bath tub with running water.

Window screens.

Separate parlor.

Finally were listed those features which all want

to provide, and which, as a matter of fact, have been provided in most of the recent large scale industrial developments. They are:

Porches and piazzas.

Lavatory bowls.

Hot water supply to bath and bowls.

Window blinds.

Window shades.

Dining room separate.

It will be noted that a cellar is not classed by Mr. Allen as a *sine qua non*, nor does he qualify his stand by omitting it for warmer climates only. On this point he said: "We are told that the family needs a cellar for the storage of coal and canned fruit, etc., and also that it costs no more after the foundation walls are put in to build it than to omit it. In investigating the contents of cellars in houses occupied by unskilled laborers, I have never found large supplies of food or fuel. The laborer is too poor to buy more than two or three hundred pounds of coal at a time, and never lays in stocks of food in advance; instead of this we usually find a miscellaneous assortment of most unsanitary rubbish and junk which is not only undesirable, but constitutes a serious fire menace. Statistics show that over 80 per cent of dwelling house fires start in the cellar in such rubbish piles as I have described. The argument that it costs no more is nearly true, where sand and gravel soils are encountered; but in clay or other hard digging the extra cost of digging the cellar mounts up considerably. Cellars are not needed for furnaces where the tenant cannot afford the fuel for them, but derives his heat from his kitchen stove."

Proceeding with a plea for simplicity and straightforwardness in design, Mr. Allen made the statement that, "Any attempt to beautify the elevation has to be paid for." We believe that this needs some further definition of the term "beautify." Would not "embellish" be a more exact word? We should not then debar as expensive that care for proportion, and disposition of void and solid, which, be the several elements the plainest of the plain, are fundamental in all architectural studies. It was probably this idea that Mr. Allen had in mind, for he went on to say, "Where it becomes a question of sacrificing necessary floor space or internal convenience for outside embellishment, the tenant, were he given a chance to vote, would almost invariably choose the interior necessities rather than the external luxuries or the alternative of higher rent."

This is unquestionably sound, and it is decidedly apropos in that it calls direct attention to the confusion that so often obtains in discussions of this problem of the minimum house. Too often the alternatives are not between the quaint, idyllic cottage and the plain, unadorned dwelling; they are between the plain, but sanitary and decent dwelling,



and nothing at all — that is to say, leaving the lowest paid worker to live as heretofore, in squalor.

Pressing on where logic leads, Mr. Allen made a plea for the flat roof, or at least an adequate attempt to combine architectural value with its unquestioned advantages in cost of construction and upkeep; a plea for the terrace type of attached house for the low paid worker, in cases where land cost becomes a prime factor; for the provision of four- and five-room houses for that minority of families for whom the sixth room forms only an added burden; for a small, judicious appropriation for trees and shrubs, in order that there may be less discrepancy between executed work and the perspective decoy, and for the application of sane town-planning principles to the selection and treatment of the development site.

Attention was again directed to the heavy burden laid upon low-cost construction by prevalent building regulations. This is true of concrete construction probably to a greater extent than in other branches, but here the unbalanced, almost ludicrous provisions of certain localities form a very serious penalty against the honest builder. Is it necessary and unavoidable that our whole standard of lawful building be based upon the principle of protection against the jerry builder and the crook? Is there not some way, by arranging special inspection provisions, or by making the responsibility of the contractor for his building a continuing one, that the building laws may be newly based upon the assumption of the builder's good faith, rather than upon a usually unjust assumption of his dishonesty?

Mr. Richard A. Dana, Jr., who contributed a paper on "The Best House for the Small Wage Earner," is frankly an advocate of the semi-detached, or group house. "The one-family, free-standing house," he says, "is now too expensive to build, heat, and maintain for rentals under \$20 a month." Mr. Dana, by the way, performed a distinct service and, we hope, set a precedent when he thus specifically set limits to the scope of his paper. "On lots 25 feet wide and under," he goes on, "the narrow spaces between these houses are usually damp, dirty, and ugly. The houses are frequently so close together that the middle of two adjoining houses look directly across at each other with no decent amount of air or privacy."

After enumerating the disadvantages of the two-family house (one family living over the other), the contrasting merits of the two-family, semi-detached type were summarized as follows: "It is more economical to build per family than two one-family houses, as the party wall between the two families is less expensive than two outside walls, and also each house is easier to heat in cold weather. By economical planning one chimney and one line of plumbing can be arranged for both families" (assuming that these houses are built for rental rather

than for sale). "By having the scheme only two rooms deep, no room looks directly into another house, but looks either out toward the street or toward the back yard. Each family has three sides of their house open to the light and air, so that they do not feel shut in. Furthermore, this two-family, semi-detached house is much more pleasing in proportion than the one-family, as the length is greater than the height, and the whole building sits on the ground in a comfortable, restful way."

"Houses in rows, three to eight in a group, are cheaper still to build," he goes on. "These compositions of eight houses have great artistic possibilities on the exterior, especially if the end units are treated in a different way from those in the middle."

In commenting on construction, Mr. Dana recommended omission of all gutters and leaders; use of casement instead of double hung windows; low ceilings, with window heads well up to them; smooth painted plaster finish; narrow trim for doors and windows, unmoulded, but with rounded edges; standardization of plan into a few types, with variety gained by grouping and color treatment of the exteriors, as well as by different roofing schemes.

Mr. Dana's plea for standardization was met by an almost immediate response in Mr. Conzelman's paper on "Ready Made Houses," which, while including by implication the frame house of that description, dealt particularly with standardized houses constructed with precast hollow blocks of reinforced concrete. His paper was supplemental to that read by Mr. Atterbury at last year's conference, dealing with the same principle of construction as exemplified in Mr. Atterbury's experiments and demonstrations under the auspices of the Sage Foundation.

The firm of which Mr. Conzelman is a member has successfully applied the principle of building with precast, factory-made concrete blocks of large size to many classes of work, including train sheds, elevators, factories, round houses, railway stations, etc., but not, up to the present year, to houses. In this lies the special significance of the work described by Mr. Conzelman. Excepting only the group of houses built by Mr. Atterbury in 1913, the development for the Youngstown Sheet and Tube Company at Youngstown, Ohio, is the first attempt in house building to push to its logical conclusion the principles of standardization and wholesale manufacture by factory methods. We have had hints of progress along these lines in the tremendous improvement made in the manufacture of stock doors, windows, dressers, etc., but never a bit of help in the erection of the constructional shell of the building itself.

The ideal for the manufacture of these standardized concrete sections, which weigh up to about six tons, involves, of course, a permanent factory plant, completely equipped to provide all those advantages of continuity and organization which characterize the

well managed factory in any line of quantity production. The limiting factor in approaching such an ideal for large sized, concrete blocks is transportation, and in an increasing degree with the enlargement and increased weight of the building unit. For the present operations at Youngstown a compromise is effected by the use of a more or less temporary plant, giving, however, an approximation of the desired factory conditions.

Mr. Conzelman showed slides which were extremely interesting both in their portrayal of the project as planned on paper and in the beginnings of its execution. Mr. Allen, in his own paper, registered as his opinion that the excessive cost of equipment for casting, handling, and setting would prevent the use of precast concrete blocks for workmen's houses. Mr. Atterbury and Mr. Conzelman, on the other hand, are supremely confident not only that it is commercially possible, but that its demonstration will be conclusively effected within the near future. "My conclusion," says Mr. Conzelman, "is based on the experience gained during the last ten years in the construction of practically all types of reinforced concrete structures, all of which were constructed by unit methods. It has been fully demonstrated in this work that unit methods can more than hold their own in a field where competition is very keen. The problems met with in house construction are not so difficult as those that have been met with and overcome in the commercial structures referred to. It therefore follows that if housing contracts of sufficient magnitude can be secured, the construction can be readily accomplished by these same methods." Inasmuch as this method of construction is far and away the most radical and thorough going proposal looking toward application of big business methods to small house building, and inasmuch as it seems that the principle is now about to receive conclusive tests, progress will be watched with interest.

The other form of ready-made house, the frame building shipped from the factory in lengths cut to fit together like a picture puzzle in three dimensions—this type of house had its first hearing in a housing conference. It has heretofore been the inclination to adopt a patronizing attitude toward the concerns that advertise this product, and, in truth, many of them have hardly deserved serious consideration. But while they have been ignored, they have grown prodigiously, until now it would seem that they must be taken account of. One concern has already shipped, set up, and delivered six hundred of these houses to the English government; a repeat order of the same amount is contingent only upon shipping facilities. Unquestionably these companies are progressive; when transportation charges run high, they establish cutting mills all over the country; when the need arises, they es-

tablish financial connections likewise; to accommodate the house owner they develop a general form of contract to include all the sub-contractors; and finally, perhaps most significant of all, they are turning to the architect and to the town planner for expert advice, in order that their product may be something more than "Stock Design No. 357-A."

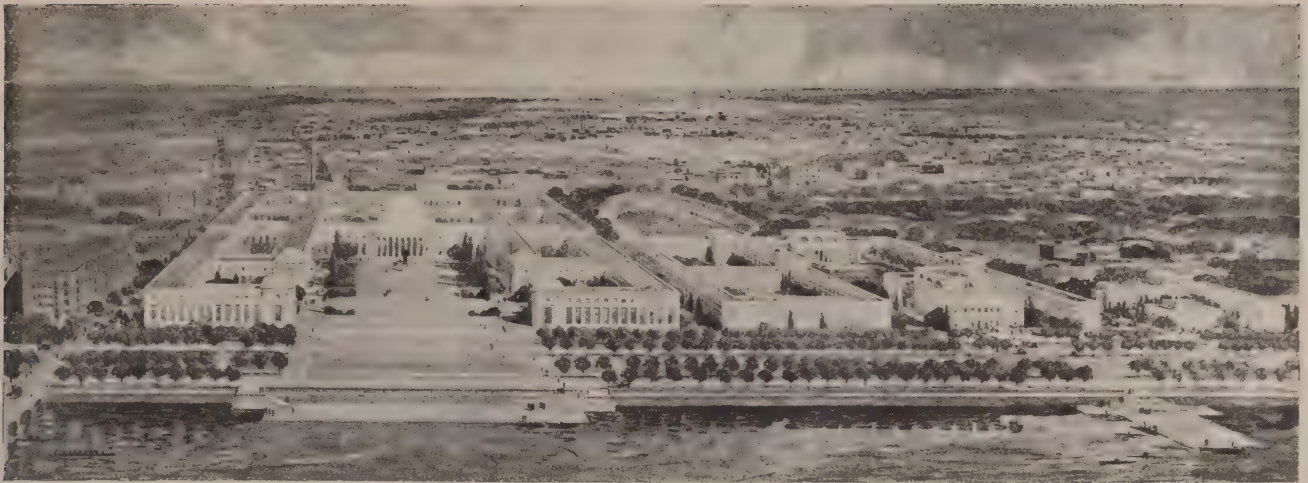
Wednesday morning's first section meeting was devoted to a symposium on housing famines and what several cities have done to cope with them. Other papers must be passed without comment or quotation, and of those on housing famines we may mention only that of Bridgeport, Conn.,

The Bridgeport Housing Company, formed to cope with perhaps the most acute of this country's housing famines, has already to its credit in this, its first year of operation, an apartment building housing 39 families, a group of terrace cottages now partly occupied and accommodating 139 families—these within the city proper, and outside but within easy trolley range, two new community groups of single family detached houses. These several developments are for the higher grade of skilled mechanics. The corporation has now under consideration a program for the common laborer,—a terrace group of 15-foot units, only 22 feet deep, with yard at the rear. A maximum of \$16 per month would be charged for four rooms and a bath.

The aim of the Bridgeport Housing Company is to bring about a condition where mortgage bonds of workingmen's homes should be as salable and as exchangeable as those of any public service corporation or industrial—in other words, to use the words of Mr. Ham's paper, to make them "liquid capital." This he believes practical through a co-operation of the manufacturers, public service corporations, and the financial interests. His recommendation to the National Housing Association is that it "appoint a committee to outline a scheme of financing which would be national in its scope, and have for its fundamental purpose, making liquid funds invested in the homes of the people."

Such, in very incomplete and hurried résumé, are some of the more salient points of the Chicago Housing Conference. We have omitted a description of the city-building that has given housing to our new national army; we have made no mention of the masterly presentation of the Zoning problem by Mr. Lawson Purdy; we have not quoted from the splendid speeches by Chicago's representatives upon her own housing problems; nor have we spoken a word of appreciation for the kaleidoscopic motor view of Chicago's playgrounds, her parks, her boulevards, and the general spacious way she does her planning. For all these, and many other matters, we must make use of the architect's perennial note, "See Future Detail," which in this case refers to the forthcoming volume of the Proceedings of the Conference.





## The New Buildings at Massachusetts Institute of Technology

### AN APPRECIATION OF THEIR ARCHITECTURE

By GEORGE ELLING

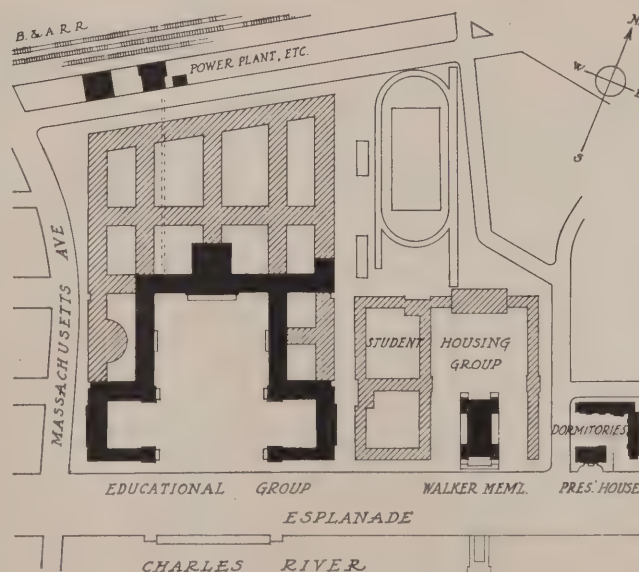
**A** GLANCE at the block plan of the Massachusetts Institute of Technology group suffices to show that the land was apportioned to an educational group on the west and a students' group on the east. The bird's-eye view shows how the lines of the educational group are to be carried along into the students' group to make one composition of the whole mass of buildings as seen from the Boston water-front.

A light and fine Roman brick is being used with limestone trimmings so that there will be no break in the color value, and though the scale of the openings of the students' group naturally produce a much finer spotting, towers at certain high points are carried up over gateways and at corners of the dormitories so that the measure of height in the educational group is recalled. Another strong connecting link has been obtained by repeating the size of the minor order of the main court pavilions in the façade of the Walker Memorial. This order is approximately 30 feet high. Greek Ionic in the pavilions, the order has been pleasantly converted at the Walker Memorial into a sort of Pompeian Doric. The treatment of the Walker Memorial frontispiece will further serve to unify the two groups by its strongly emphasized lower story and subordinated attic, which is the characteristic motif.

The first dormitory having been built synonymously with the President's house, was made to form a background to shield the latter from the factories and commercial structures in the rear. Thus a pleasing little composition was produced with a garden enclosed between the two buildings and elevated by high walls above the surrounding grades so that passers-by may not see in. The students, on the other hand, enjoy glimpses of the garden from their windows, and the sentiment of relationship between the two buildings and the garden suggests agreeably the real relationship of the students to the President; for Dr. and Mrs. MacLaurin keep closely in touch with them, each student being invited several times during the winter to the President's house for social evenings.

The residence was presented to the Institute by Mr. Charles A. Stone and Mr. Edwin S. Webster, who have often said that they owed their business success to their training at the Institute. The buildings were built by their organization at cost, and it was of inestimable value to the Institute to have the benefit of the disinterested co-operation of two such loyal alumni.

The building seems to be ideal for its purposes. Its lines preserve the fine simplicity of the educational buildings, with the same motive of composition — a high first

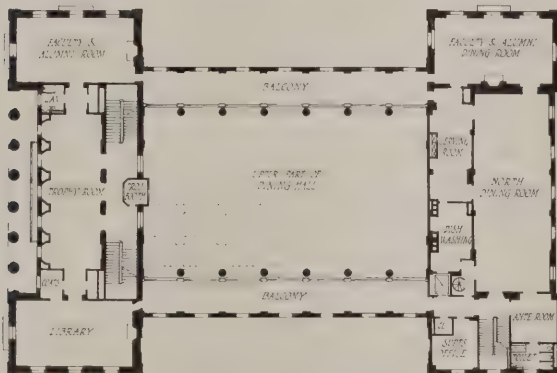


Plot Plan of Complete Group

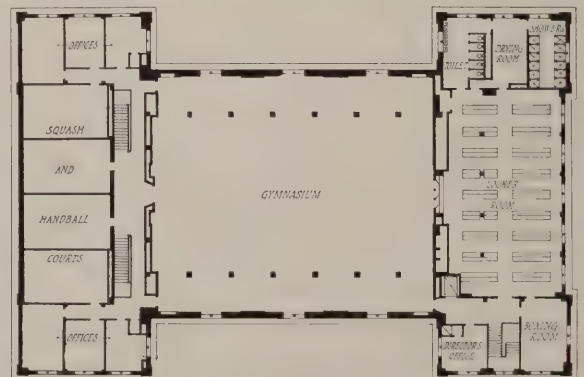
Portions Shown Solid Are Built, Those Shaded Are Future Buildings



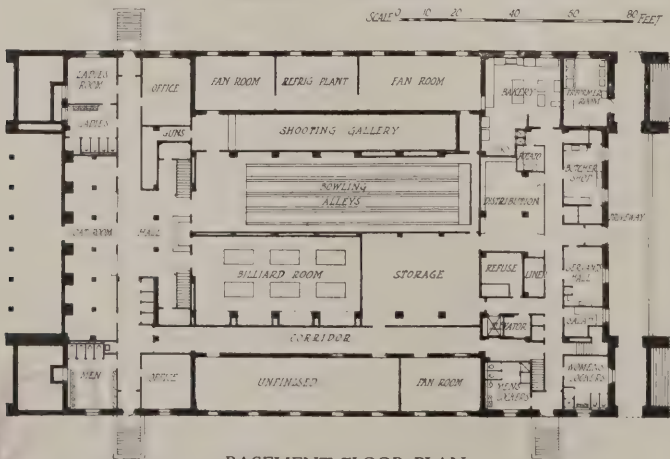
GENERAL VIEW OF SOUTH AND EAST FAÇADES



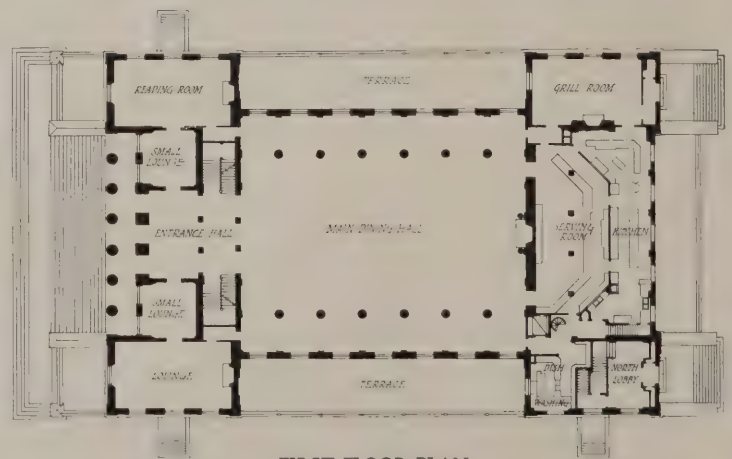
SECOND FLOOR PLAN



THIRD FLOOR PLAN



BASEMENT FLOOR PLAN



FIRST FLOOR PLAN

WALKER MEMORIAL, MASSACHUSETTS INSTITUTE OF TECHNOLOGY, CAMBRIDGE, MASS.

WILLIAM WELLES BOSWORTH, ARCHITECT



story with subordinated windows above. A tower room on the flat roof gives the domestic air of many of the Italian villas, and at the same time harmonizes with the silhouette of the dormitory in the background. Boston viewed from the terraced roof, or second story windows, particularly at sunset, when Beacon Hill glows in reds and violets behind the blue water of Back Bay, with the gold dome of the State House reflecting the sun like a burning ember, makes an ever changing panorama of beauty, as fine as any town and water subject in the world, not even forgetting Whistler's impressions of Venice. The arches and towers of the bridge connecting Boston with Cambridge are especially effective from this point of view. Bunker Hill monument and the tower of the Customs House make fine touches of verticality in contrast with the prolonged horizontal lines of the masses of houses stretching toward the Back Bay district. The house is planned for the double purpose of entertaining students as well as a dwelling for the President. Connection is made from the front door directly with coat rooms in the basement, and the stairs are so planned that guests are then conducted into a large reception hall. The spacious living room faces south and west, while the dining room is placed at the eastern corner, and the President's study occupies the space between this and the entrance vestibule. A little private entrance is effected from the vestibule into the study. The stair is a spiral, of graceful proportions; the living room is finished in Italian walnut with a stone mantel and beamed ceiling; the reception hall and dining rooms are paneled in oak; while the entrance vestibule is of Caen stone with stair of Botticino marble. The house is completely equipped with modern appliances, including electric laundry machines, dumbwaiters, and cooking appliances.

The exterior of this interesting building is unique. The high walls of the elevated garden are recessed in a semicircle toward the front entrance, thus producing a charming air of dignity and elegance. The doorway has been treated with just the right amount of carving to give it grace and refinement. This is characteristic of the whole house in fact, with its flat fluted pilasters and lovely caps of a Pompeian Corinthian character. Two delicate elongated vases surmount the pilasters at the sides of the central bay and connect the composition with the tower pavilion on the roof. The air of the mansion as a whole expresses a delightful balance of sobriety and lightness of touch, held in fine reserve, which produces a most pleasing feeling on the mind of the careful observer.

The same spirit is felt in the exterior treatment of the dormitories, though the fact that the pilaster and column capitals and ornaments are not yet carved, leaves something still to be desired; and of course one looks forward to iron fences and planting. The

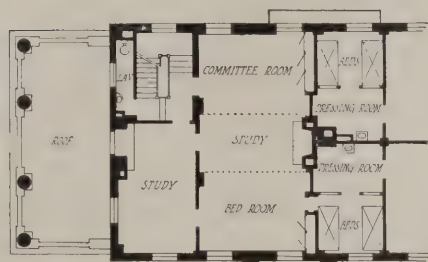
grouping of the tower with its columned portico is most picturesque and satisfying. Here again the harmony has been skilfully retained between the spirit of the architecture of the educational group, so severely classic, and this free and light adaptation of classic lines and detail to a building well expressing the character of a home for students.

In the Walker Memorial one finds a similar harmony of architectural style and character, but handled with a more robust and monumental feeling, as the uses of the building would naturally require. One senses at a glance the gymnasium, with its large arched windows at the top; the great dining hall on the main floor in the center, with its outdoor terraces between the recessed spaces of the projecting corner motifs; and chiefly, of course, the broad flight of steps (which Institute students have always associated with their social life)—a tradition from the Rogers Building in Boston. Here the steps are more broad and hospitable, with seats and platforms, and one pictures many informal gatherings of students about the spacious portico.

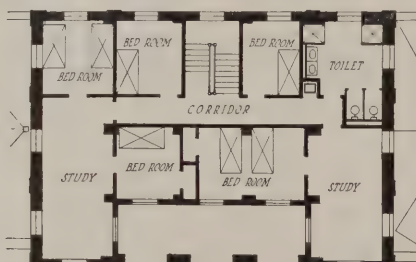
This building was taken over by the United States service before it was entirely completed, especially as regards its interior decoration. Students are quartered in the gymnasium, and even in the galleries of the dining hall, where burlap curtains have been hung, therefore no illustration is presented for it would not express the final appearance of this room; the section shown on Plate 99 indicates its character, however. The furniture is made to fold and stack in order that the floor may be cleared for dancing, and a wide floor area has been effected unencumbered by points of support. The bust of General Walker from the Rogers Building has been fittingly placed in the monumental mantelpiece at the end opposite the entrance. The room is beautifully lighted from both sides and presents an aspect of proportion and character which harmonizes admirably with the spirit of Technology. The building is of course a carefully worked out organism of club rooms for the students, and for the faculty and alumni, with attendant dining rooms and kitchen accommodations, as well as recreation rooms, bowling alleys, squash courts, gymnasium, students' committee, and trophy rooms. The Walker Memorial was erected from contributions of the alumni, and when the war is over and Technology settles down again to normal conditions, it should prove once more how important a factor sane, sober, and beautiful architecture may be when fittingly adjusted to the purposes which it is intended to serve. These buildings as a whole are a strong fulfilment of this ideal, and one impatiently awaits the additional dormitories in the spaces between the Walker Memorial and the Educational Group to complete this picture, surely the most interesting, educational *ensemble* of modern times.



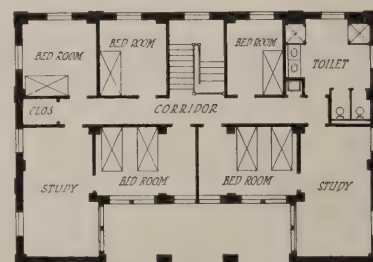
VIEW FROM CHARLES RIVER ROAD SHOWING PRESIDENT'S HOUSE AT LEFT



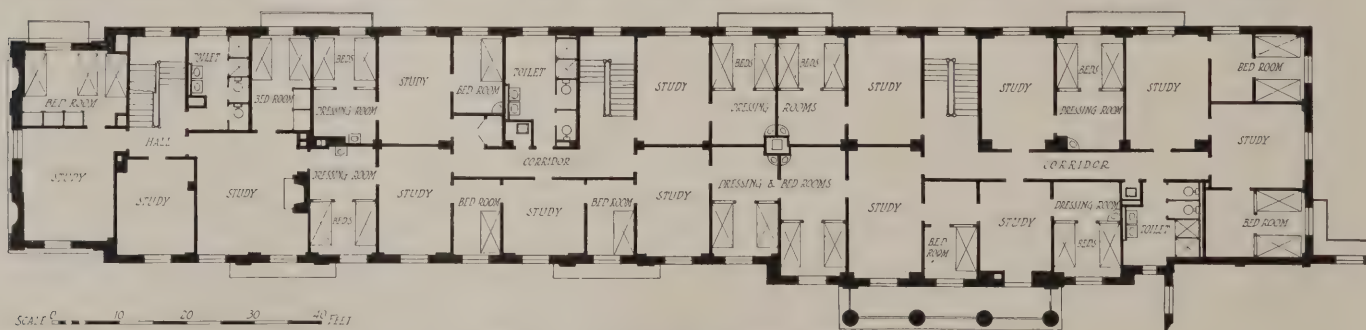
FOURTH FLOOR PLAN, FRATERNITY END



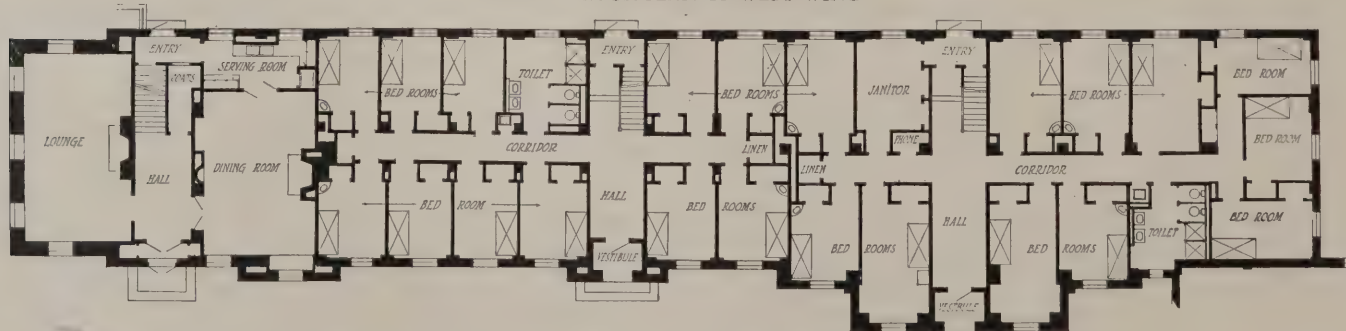
FIFTH FLOOR PLAN OF TOWER



SIXTH FLOOR PLAN OF TOWER



TYPICAL FLOOR PLAN OF WEST WING



FIRST FLOOR PLAN OF WEST WING, COMPRISING HOUSES A, B, AND C

DORMITORIES, MASSACHUSETTS INSTITUTE OF TECHNOLOGY, CAMBRIDGE, MASS.

WILLIAM WELLES BOSWORTH, ARCHITECT



# Student Housing at the Massachusetts Institute of Technology

By H. E. KEBBON

**D**URING the summer of 1912 preceding the preparation of the architectural plans for the new Technology buildings, representatives of the Institute visited the foremost colleges and universities of this country and prepared detailed reports of the important educational features found at these institutions. At the request of the Alumni Committees appointed by the Alumni Association, supplementary reports were submitted covering the provisions for student welfare found at these same universities, embracing both the social centers or "Unions" and the student housing systems. A wealth of material was thus collected covering the following general subjects:

General floor plans and elevations, cost of construction, dining facilities, commissary systems (waiter or cafeteria service), governing boards (faculty or student members or both), charges to students, itemized cost of upkeep, budget, sources and amount of income, business systems, number of students accommodated compared to total enrolment, special features, etc.

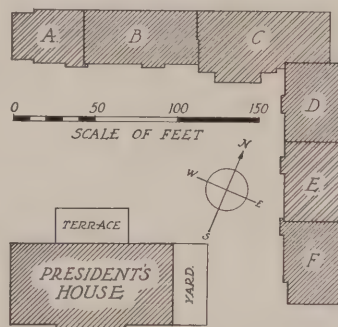
From this data charts were prepared of both the students' clubhouses and dormitories, giving the unit cost of construction and space allotted per student, cost per student, expense of operation, etc., which resulted in a final chart of averages reducing this information into constants which, when multiplied by the number of students to be accommodated, gave a basis for

determining the size and cost of the Technology requirements.

This data was supplemented by photographs of special features, and the architects of the different buildings were freely consulted and gave valuable aid in suggesting modifications or changes resulting from their experience.

The schools possessing clubhouses comparable with the one contemplated for Technology were the University of Pennsylvania, Harvard University, Brown University, Ohio State University, University of Chicago, and the University of Toronto. Each of these schools contributed at least one important element for consideration. The general plan of Houston Hall at Pennsylvania was interesting; the large dining room, serving also as an assembly room at Harvard Union, was a contribution; the dining facilities at the University of Chicago were full of suggestion, and the cafeteria dining service used in some of the Western universities led to its adoption at Technology.

The various dormitory systems offered a wide range to choose from. Some of the colleges held to the unit housing scheme, each house accommodating from twenty to forty men with individual staircases serving each; while others were given to the hotel arrangement of rooms, opening from long corridors in buildings four to eight stories high. The proportion of rooms in suites to single



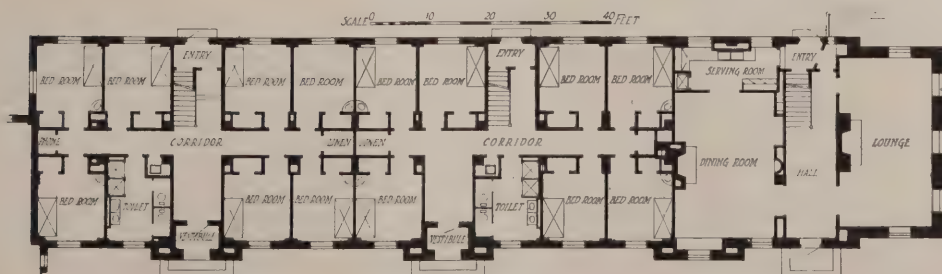
Plan Showing Divisions of Dormitory and President's House



Typical Floor Plan



Fourth Floor Plan, Fraternity End



First Floor Plan



Basement Plan, Fraternity End

Floor Plans of South Wing of Dormitories Comprising Houses D, E, and F

rooms was carefully studied, as well as the matter of sleeping porches and toilet accommodations.

The Pennsylvania dormitories, together with those at Yale, Princeton, and Northwestern University, contributed valuable material.

After this mass of information had been carefully compiled, as mentioned above, many conferences were held by the two alumni committees: one of the Walker Memorial Committee, charged with the supervision of the clubhouse to be erected in memory of Technology's eminent soldier president, General Walker, and the other the Student Housing Committee having the dormitory problem to solve.

These committees, after many meetings, presented carefully considered reports to the President of the Institute, setting forth their recommendations for their respective projects, and preliminary plans were prepared by William Welles Bosworth, the architect, incorporating their suggestions for both buildings. These plans were placed before the Alumni Association for comment and after several revisions were adopted and the construction was started.

The Walker Memorial plan and elevations clearly indicate the characteristics of the interior arrangement. The *pièce de résistance* is the large dining hall in the center of the plan accommodating nearly a thousand students. The service unanimously chosen for providing this large number of men with meals



View Looking West Showing Dormitory Entrances

was the cafeteria system, although there is in addition a smaller dining room with *table d'hôte* service, and a grill room and faculty dining room, provided with special order cooking.

The cafeteria service is installed to provide for the noon meal only, as the majority of the students do not live near the Institute and are only present during the middle of the day. The main dining room may be easily cleared of chairs and tables and used for dances and other forms of entertainment. Directly over the dining room is the gymnasium, expressed exteriorly by the large semicircular windows which provide excellent lighting. The remaining rooms are assigned to reading or writing, student offices, and the usual adjuncts. Directly back of the broad attic, above the entrance colonnade four squash racquet courts are located.

The dormitories incorporate the staircase system of student houses. The rooms are so arranged that the sleeping rooms are literally porches, unheated and open to the weather if desired, but are provided with dressing rooms immediately adjacent. These are located on the south side of the buildings in nearly all cases. The single rooms compose the first floor plan and the suites, comprising a study, dressing room, and sleeping porch, are on the upper floors. Fraternity houses are included in the dormitory building, occupying the end sections in the two wings.



View from Charles River Road Looking West Toward Educational Group





PRINCIPAL FACADE

WALKER MEMORIAL, MASSACHUSETTS INSTITUTE OF TECHNOLOGY, CAMBRIDGE, MASS.

WILLIAM WELLES BOSWORTH, ARCHITECT







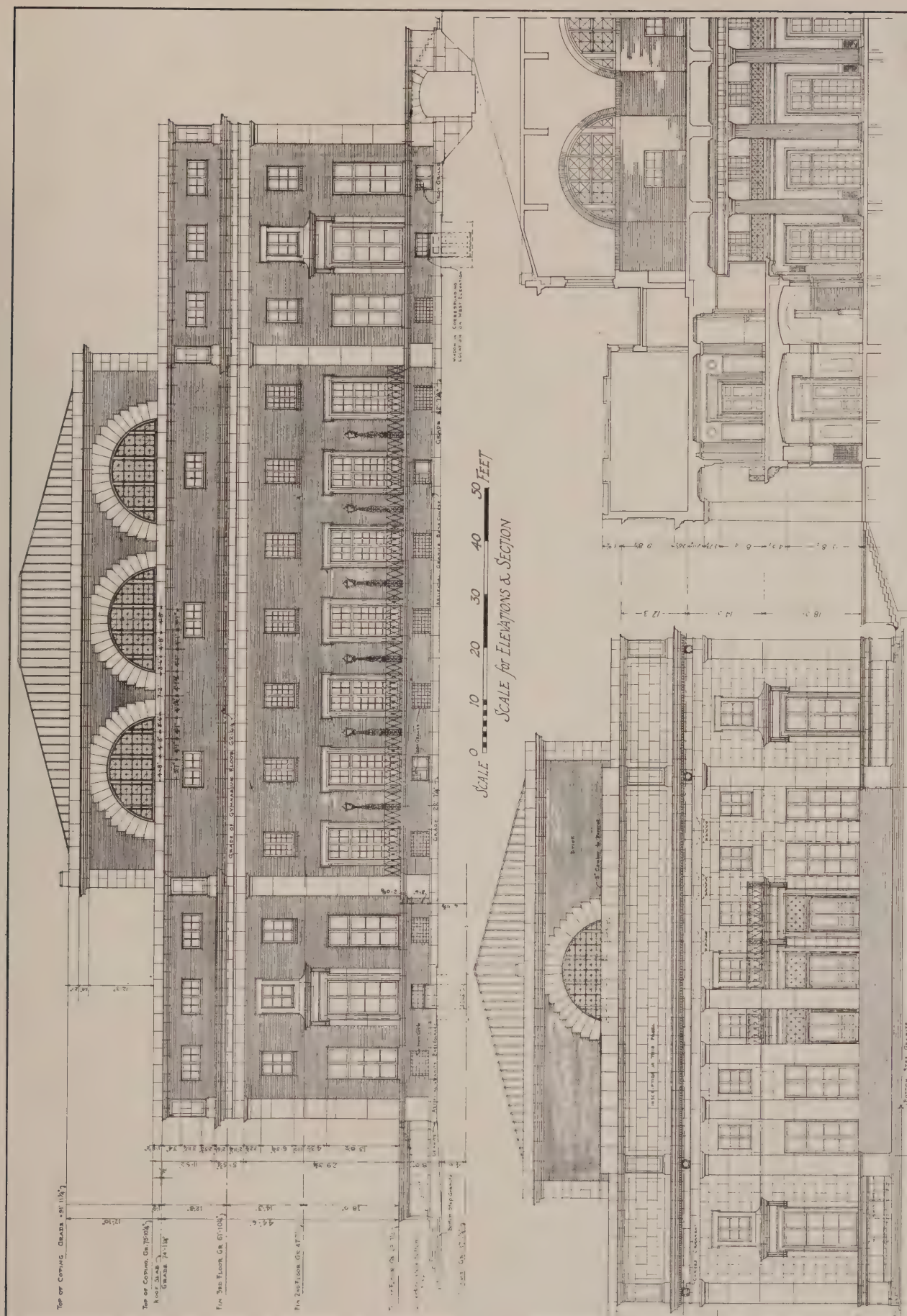
DETAIL OF PRINCIPAL FACADE

WALKER MEMORIAL, MASSACHUSETTS INSTITUTE OF TECHNOLOGY, CAMBRIDGE, MASS.

WILLIAM WELLES BOSWORTH, ARCHITECT







SOUTH ELEVATION

WALKER MEMORIAL, MASSACHUSETTS INSTITUTE OF TECHNOLOGY, CAMBRIDGE, MASS.

WILLIAM WELLES BOSWORTH, ARCHITECT

### ONE-HALF LONGITUDINAL SECTION







GENERAL VIEW FROM PRESIDENT'S GARDEN

DORMITORY BUILDINGS, MASSACHUSETTS INSTITUTE OF TECHNOLOGY, CAMBRIDGE, MASS.

WILLIAM WELLES BOSWORTH, ARCHITECT







VIEW OF WEST WING FROM PRESIDENT'S GARDEN

DORMITORY BUILDINGS, MASSACHUSETTS INSTITUTE OF TECHNOLOGY, CAMBRIDGE, MASS.

WILLIAM WELLES BOSWORTH, ARCHITECT







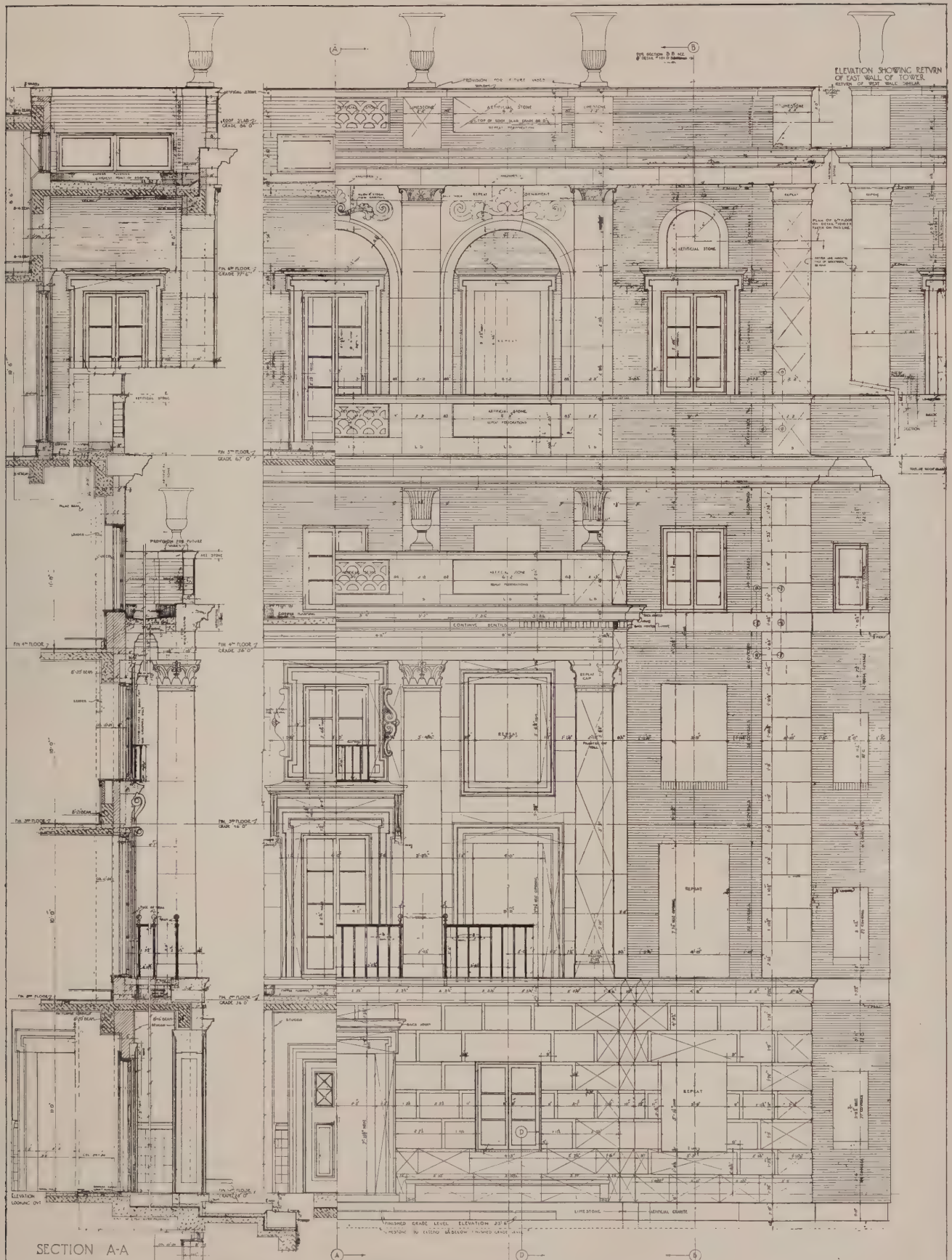
DETAIL OF TOWER

DORMITORY BUILDINGS, MASSACHUSETTS INSTITUTE OF TECHNOLOGY, CAMBRIDGE, MASS.

WILLIAM WELLES BOSWORTH, ARCHITECT













VIEW OF STREET FACADE



PRESIDENT'S HOUSE; MASSACHUSETTS INSTITUTE OF TECHNOLOGY, CAMBRIDGE, MASS.

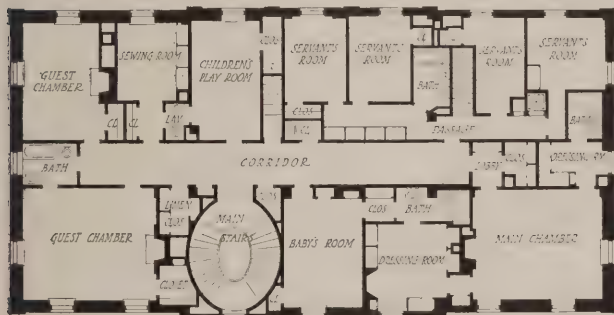
WILLIAM WELLES BOSWORTH, ARCHITECT



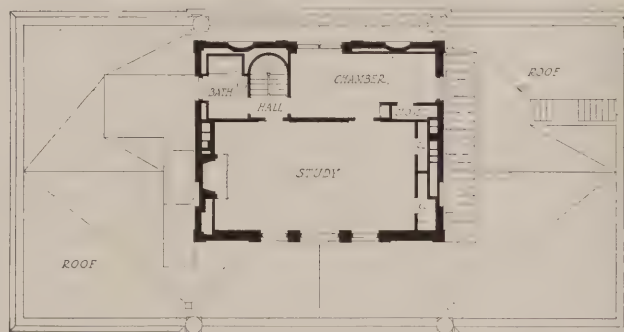




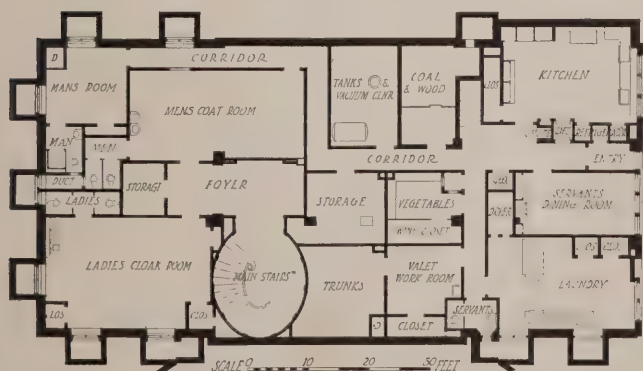
VIEW OF GARDEN FACADE



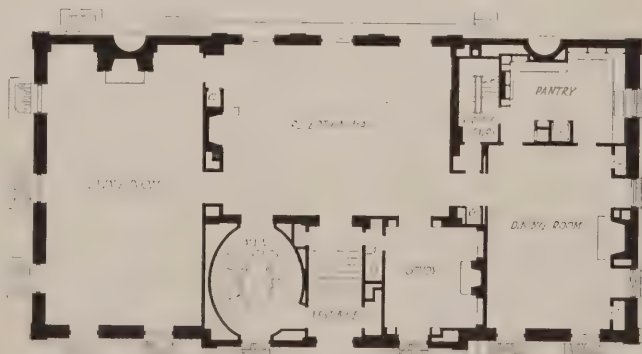
SECOND FLOOR PLAN



THIRD FLOOR PLAN



BASEMENT FLOOR PLAN



FIRST FLOOR PLAN

PRESIDENT'S HOUSE, MASSACHUSETTS INSTITUTE OF TECHNOLOGY, CAMBRIDGE, MASS.

WILLIAM WELLES BOSWORTH, ARCHITECT







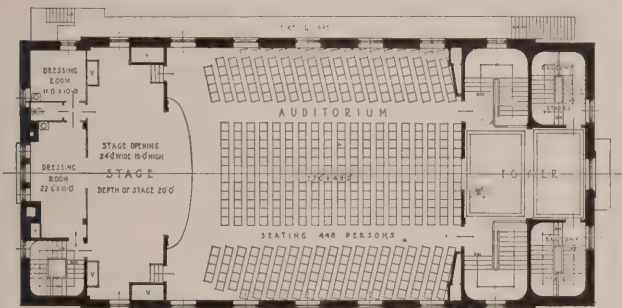
VIEW OF PRINCIPAL FACADE  
TOWN HALL, WESTON, MASS.  
BIGELOW & WADSWORTH, ARCHITECTS



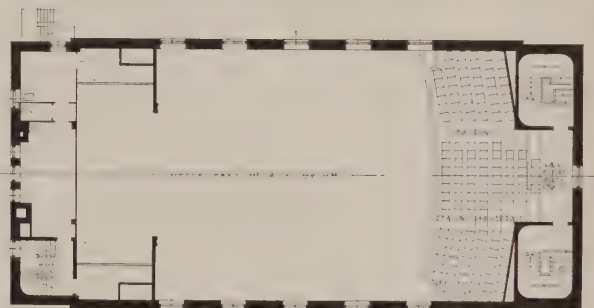




GENERAL VIEW



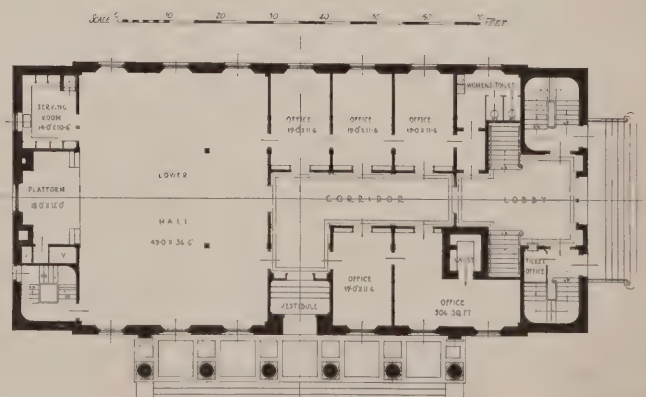
SECOND FLOOR PLAN



THIRD FLOOR PLAN



BASEMENT FLOOR PLAN



FIRST FLOOR PLAN

TOWN HALL, WESTON, MASS.  
BIGELOW & WADSWORTH, ARCHITECTS







VIEW OF AUDITORIUM LOOKING TOWARD GALLERY



VIEW OF AUDITORIUM LOOKING TOWARD STAGE

TOWN HALL, WESTON, MASS.

BIGELOW & WADSWORTH, ARCHITECTS







GENERAL VIEW OF EXTERIOR

CHAMBER OF COMMERCE BUILDING, ROCHESTER, N. Y.  
CLAUDE BRAGDON AND FOSTER & GADE, ASSOCIATE ARCHITECTS







BASEMENT FLOOR PLAN



CHAMBER OF COMMERCE BUILDING, ROCHESTER, N. Y.  
CLAUDE BRAGDON AND FOSTER & GADE, ASSOCIATE ARCHITECTS

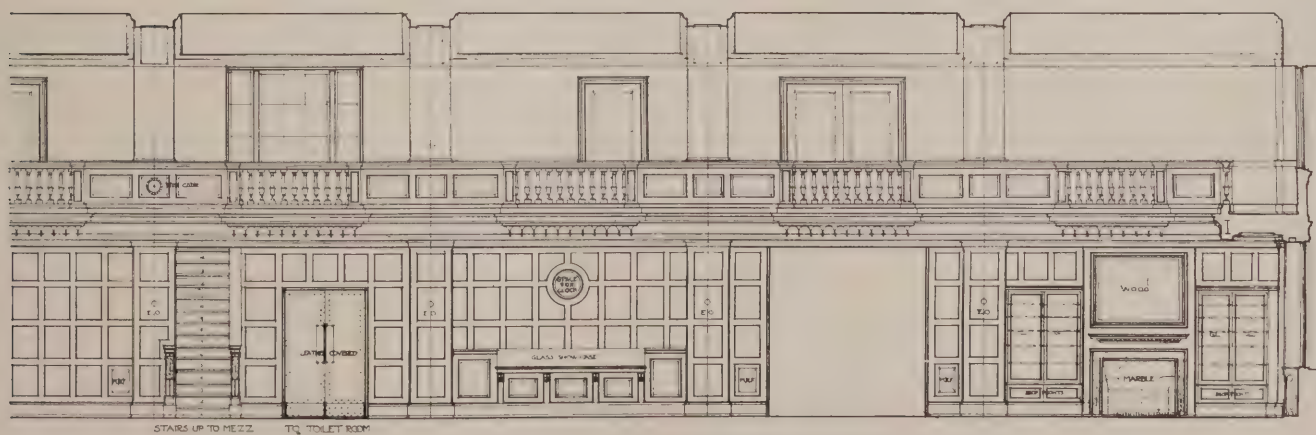
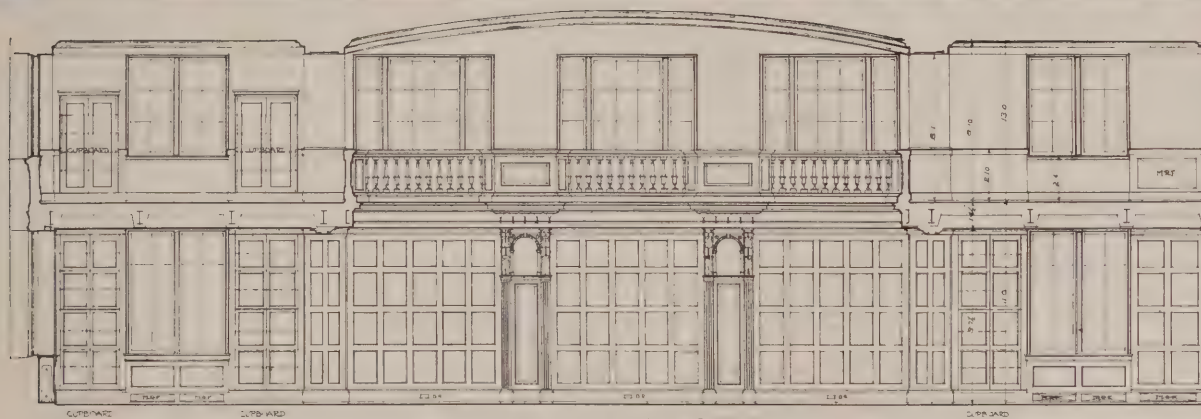


FOURTH FLOOR PLAN

FIRST FLOOR PLAN







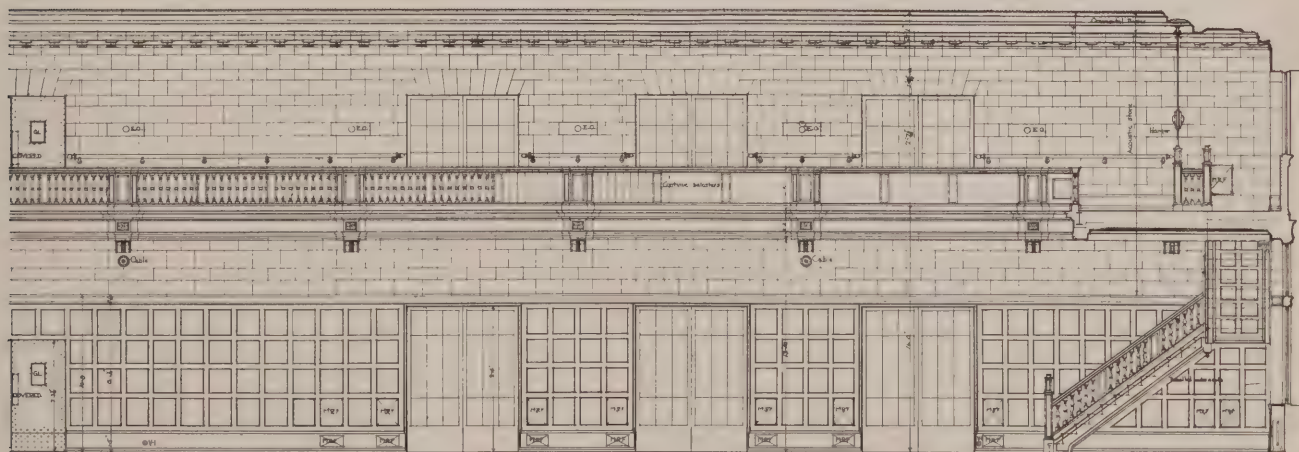
CHAMBER ROOM, CHAMBER OF COMMERCE BUILDING, ROCHESTER, N. Y.  
 CLAUDE BRAGDON AND FOSTER & GADE, ASSOCIATE ARCHITECTS







PORTION OF ELEVATION LOOKING SOUTH



PORTION OF ELEVATION LOOKING NORTH

ASSEMBLY ROOM, CHAMBER OF COMMERCE BUILDING, ROCHESTER, N. Y.  
 CLAUDE BRAGDON AND FOSTER & GADE, ASSOCIATE ARCHITECTS





# The Rochester Chamber of Commerce

CLAUDE BRAGDON AND FOSTER & GADE, ASSOCIATE ARCHITECTS

THE Rochester Chamber of Commerce Building is the three-dimensional embodiment of an idea.

This idea finds expression in the word "together."

For good or for ill the old "cellular system" of separate rooms for separate functions has been boldly and definitely abandoned in favor of a single chamber room in which all the various activities of the organization are carried on simultaneously. This great room, open in every part to all who enter, silently yet eloquently preaches the new business and social morality, "Live openly." It conduces to sociability, to co-operation; it fosters the spirit of true democracy.

Above this room devoted to the work and daily uses of the chamber is an assembly hall capable of accommodating one thousand persons for large luncheons, formal dinners, meetings, lectures, and the like.

Everything else is subsidiary to these two rooms. Their size, proportions, decoration, furnishing, are such as to conduce to dignify and beautify the life that goes on in them. For such another wedding of art and commerce it is necessary to hark back to fifteenth century Florence, or to the English guild-halls of the seventeenth and eighteenth centuries.



Reading Alcove on Main Floor

Indeed, the chamber room, with its wealth of oak paneling and its ornamental plaster ceiling, somewhat suggests a Georgian guildhall, despite its modernity in all matters pertaining to comfort and convenience and the complex machinery of business.

The dimensions of this room are 63 by 108 feet. It is subdivided by two rows of piers, making a central nave 33 feet wide and 24 feet high, and two side aisles about 15 feet wide. Above these are mezzanines, reached by two stairways and con-

nected across the ends of the room by means of shallow galleries bracketed out from the faces of the end walls.

Up to the height of the gallery rail—a distance of about 16 feet—the room is wainscoted entirely in white quartered oak of a grayish brown color. Above this the walls are of plaster and the ceiling a shallow, segmental vault, also of plaster. This ceiling is richly but rationally ornamental. That is to say the ornament, instead of being meaninglessly applied, forms an integral part either of the illuminating or of the ventilating system.

That half of the central section of the chamber room nearest St. Paul street is dedicated to social and recreational uses. It is furnished in French wal-



Conference Room



Corner of Lunch Room

nut, with comfortable chairs and settees upholstered in blue leather. Two double writing desks occupy the spaces between the front windows, and the northeast alcove under the mezzanine is fitted up as a library, with a fireplace, bookcases, magazine rack, and easy chairs. The corresponding alcove on the south, on the corner of St. Paul and Mortimer streets, is partitioned off to form the secretary's private office. The assistant secretaries occupy a space of 45 by 15 feet on the south side, separated from the main room only by a railing. The office is directly opposite this, on the north side. This brings it immediately adjacent to the entrance and in the very center of things. The bookkeepers and telephone operator are here. It is the dispensary of information, newspapers, and cigars.

The entire rear half of the chamber room is devoted to the uses of a restaurant to accommodate the daily influx at the luncheon hour. The entire north mezzanine is also arranged for the service of meals

wide ascends to the various floors and communicates with marble lined halls.

Off of one of the two landings of this stairway is a conference room for meetings of a private nature. It is a low room, lighted only from above, paneled from floor to ceiling, like the cabin of a ship. The room is beautifully furnished as a memorial to Benjamin

to the various committees which meet for lunch, according to a custom long established in this organization.

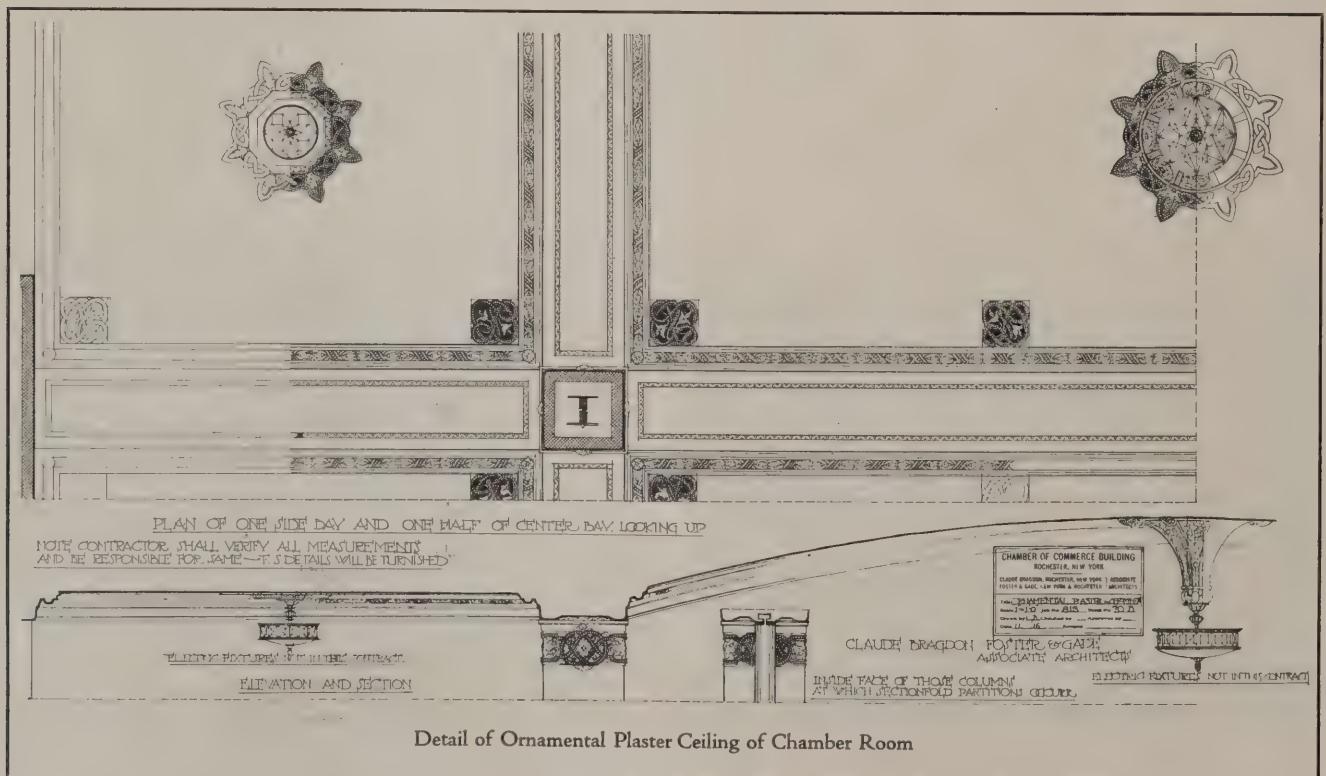
The south mezzanine is given over entirely to business, being occupied by the clerical, stenographic, and departmental forces.

Directly behind the office are the coat and toilet rooms, provided with the latest and best equipment, wainscoted with structural glass and floored with tile.

The approach from the street to the chamber room is through a lofty vestibule completely lined with Botticino marble and floored with gray Tennessee marble. From it a marble stairway 8 feet

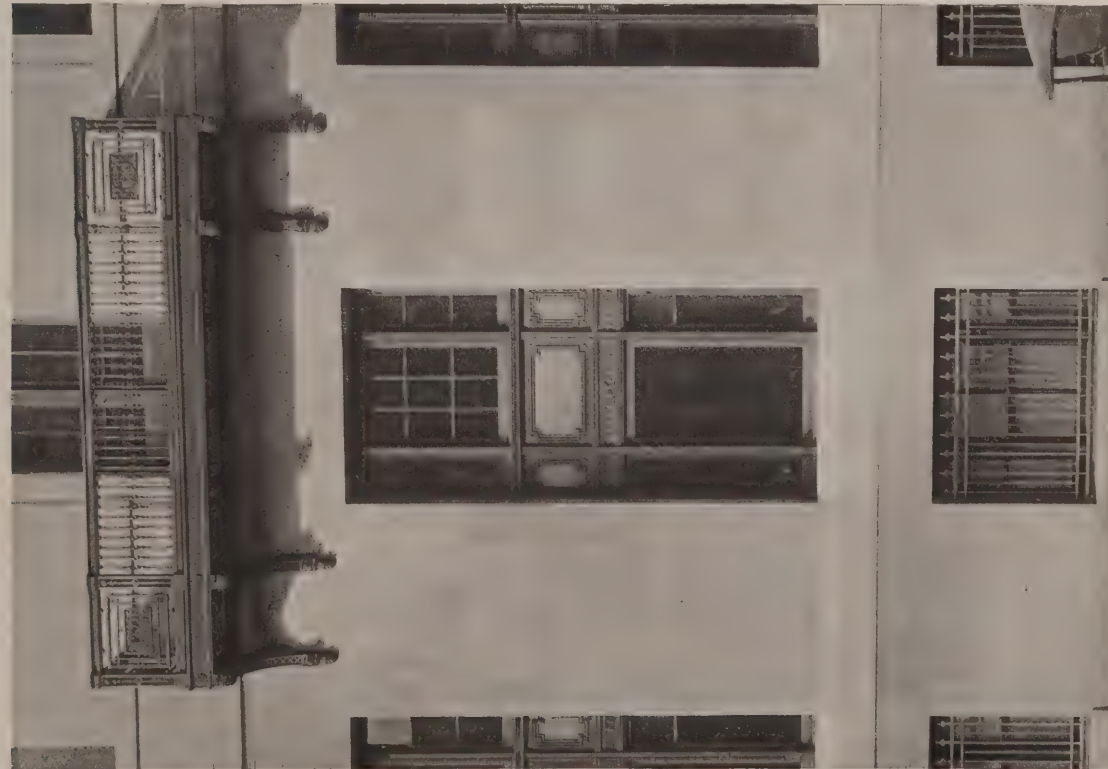


Lighting Fixture of Chamber Room

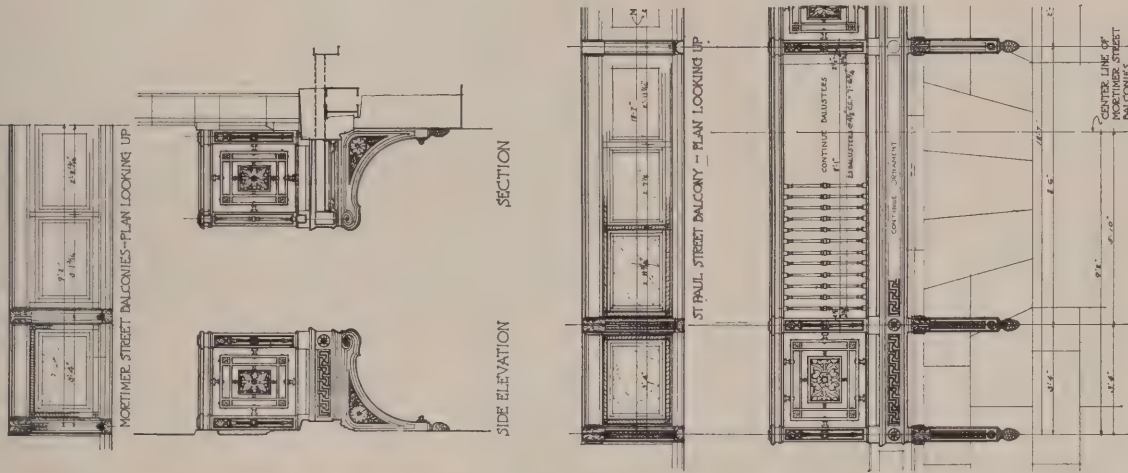


Detail of Ornamental Plaster Ceiling of Chamber Room





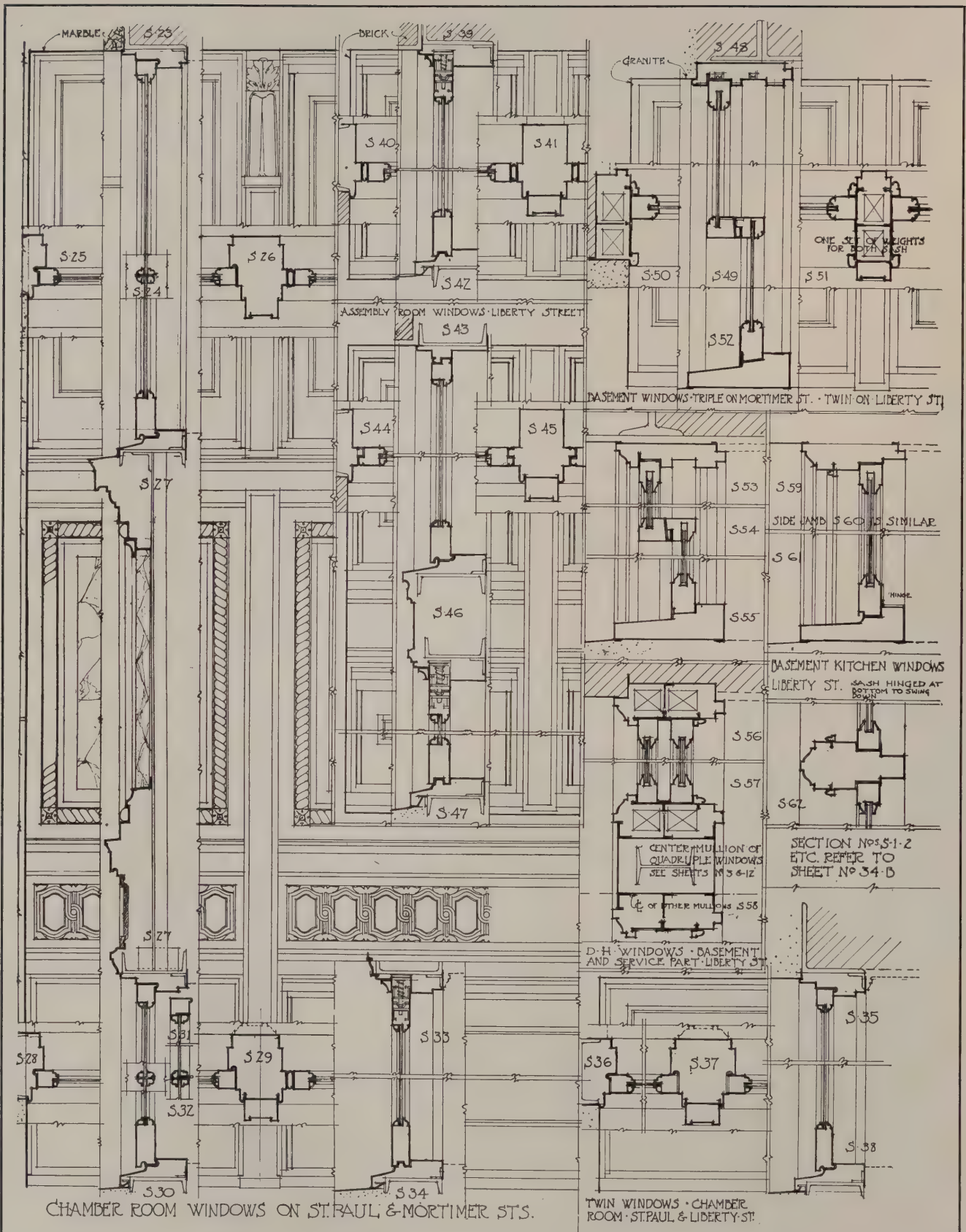
DETAIL OF LOWER STORY WINDOWS AND BALCONY



ELEVATIONS AND DETAIL OF BALCONY

CHAMBER OF COMMERCE BUILDING, ROCHESTER, N. Y.

CLAUDE BRAGDON AND FOSTER & GADE, ASSOCIATE ARCHITECTS



DETAIL OF WINDOWS AND METAL WORK OF LOWER STORIES

CHAMBER OF COMMERCE BUILDING, ROCHESTER, N. Y.

CLAUDE BRAGDON AND FOSTER &amp; GADE, ASSOCIATE ARCHITECTS





Detail of Balcony at Ends of Chamber Room

F. Chase, Treasurer of the Chamber for twenty-two years.

The assembly room is of the same dimensions as the chamber room, but being more lofty and without piers or columns, it looks larger. The ceiling is plaster, richly ornamented. There is a 9-foot wainscoting of quartered oak, stained dark, and between the top of this wainscot and the cornice the walls are covered with stone of a delicate rose-gray color—a manufactured product having valuable acoustic properties. A broad gallery with a heavy wooden entablature and balustrade extends around three sides of the room, and on the side opposite the entrance is a long, low stage behind which rises an impressive frontispiece of wood and green marble, having in gold letters on its attic the following inscription taken from the inaugural address of Jonathan Child, the first Mayor of Rochester:

“In the intercourse of social life, and on all occasions involving the interests of our young city, let us forget our politics and our party and seek only the public good.”

The frieze of this entablature has the legend, “Commerce carries civilization around the world.”

Above the assembly room is a penthouse containing the ventilating machinery. Both the chamber room and the assembly room are ventilated by means of a plenum system, whereby a copious and constant supply of fresh washed air is provided and the vitiated air exhausted.

The kitchen occupies the rear of the basement and is connected with a serving room on every floor by means of six electric automatic dumbwaiters. By reason of the fall of the ground toward the river, the kitchen receives an abundance of daylight from the rear.

Everything possible has been done to make the kitchen the best equipped, most convenient, and most sanitary that can be devised. The walls are lined with white enameled brick. The floors are of composition tile, the ventilation and drainage are of the most modern type. In connection with the kitchen is a large bakery and ice-cream room. The basement also contains cold storage rooms and refrigerators, a help's dining room, toilet, and coat rooms, an office for the steward and one for the engineer, besides the heating and power plant. There is, of course, a vacuum cleaner and a garbage incinerator, and such other mechanical conveniences



Central Feature of West Wall, Assembly Room





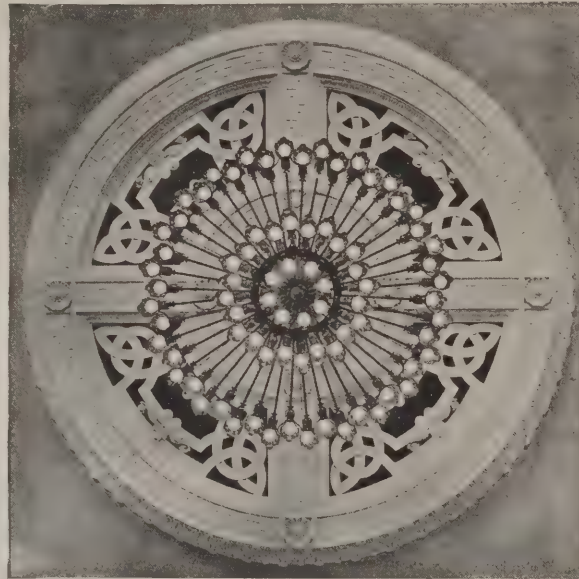
Detail of Plaster Ceiling of Assembly Room

as go to the equipment of a building of this character.

The exterior of the building is a face and not a mask. That is to say, it acquaints the beholder with the interior arrangement at a glance. Here are two rooms, their length and breadth clearly defined, and their height also, for the water table marks the floor of the one and the string course and balconies that of the other.

There is nothing meaningless nor unnecessary about the design: one feels that it has developed naturally from the plan; that interior necessity determined its physiognomy, and not the whim or preference of the designer for a particular style.

Nor could the building be easily mistaken for something other than it is, for it has the beauty, sobriety, and dignity befitting the Chamber of Commerce of a large and prosperous city. The scale and proportions are noble, the materials rich, — granite, marble, and bronze. With these materials time deals leniently; instead of deteriorating into shabbiness, the building will take on the "tone of time" with the passing years. There will stand, for future generations, not only a center of



View Looking up at Lighting Fixture of Assembly Room



Crystal Ceiling Light over Stair Well

expanding civic life and augmenting civic consciousness, but a symbol of the far sighted vision of those who conceived the idea, made that idea possible of realization, and realized it in a form so ponderable and perfect.

It will interest some to know that in this building a few of the theories of proportion contained in "The Beautiful Necessity" by one of the architects of the structure, Claude Bragdon, have been given practical application. Also some of the motifs contained in "Projective Ornament," by the same author, have been worked out in marble, glass, and plaster.

In the great epochs when architecture was a living art, geometry and number were employed not alone in the construction of a building but in its design — for the determination of its principal proportions, exterior and interior, and the proportions of its subordinate parts. The present-day architect appears to be content to forego the advantages of this valuable aid to design. Because it is simple, perhaps it seems to him foolish; but the simple things are the vital things, and these cannot safely be ignored.



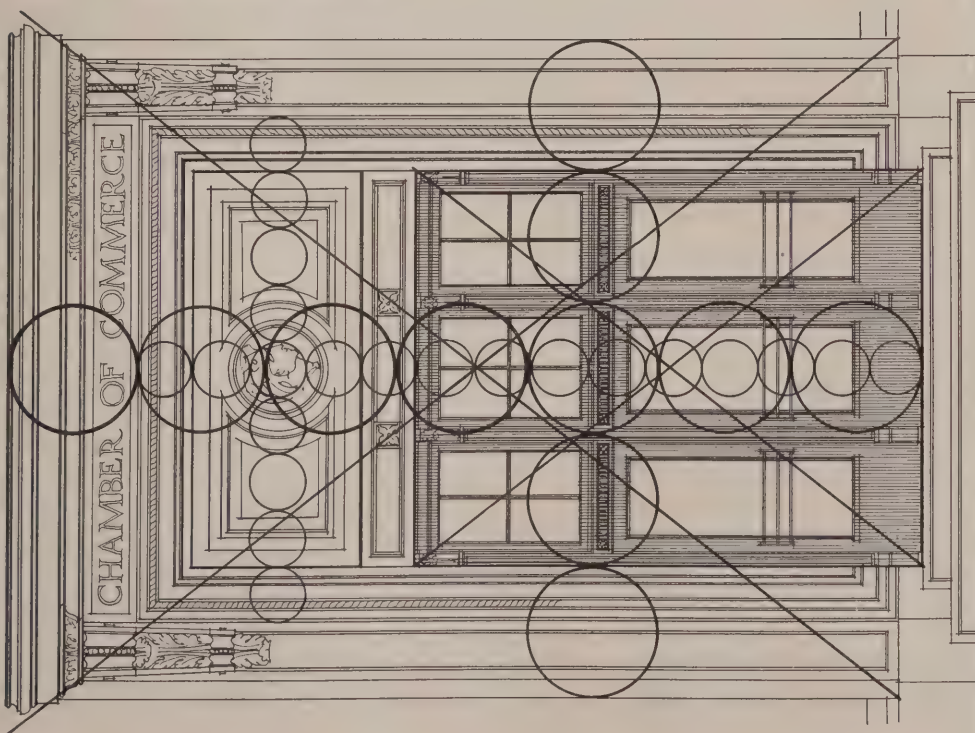
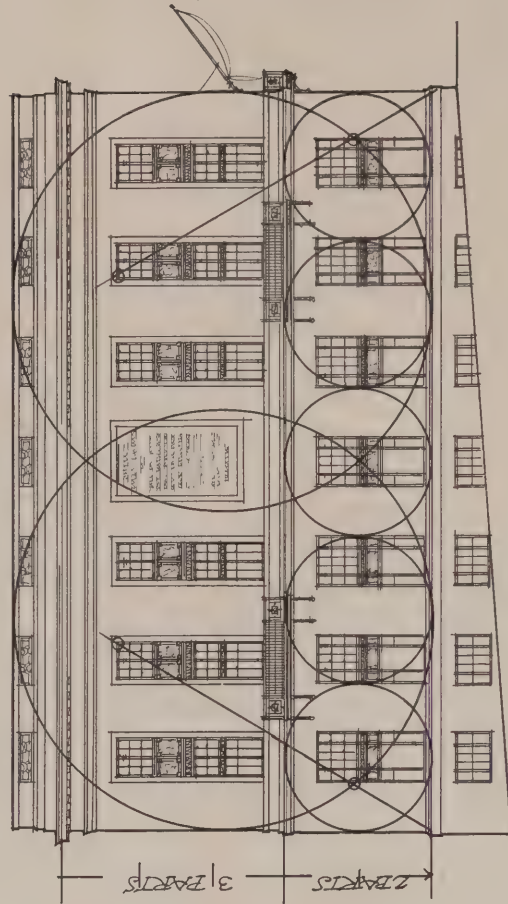
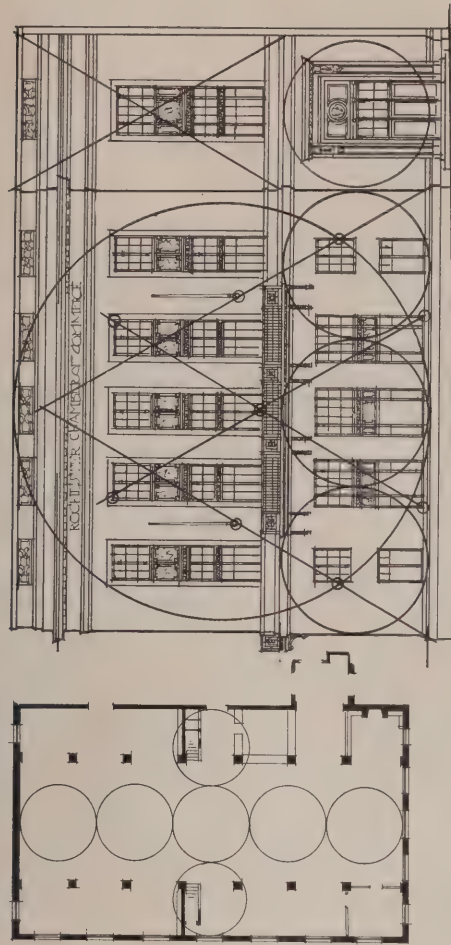


DIAGRAM ILLUSTRATING THE EMPLOYMENT OF SIMPLE RATIOS IN DESIGN OF ENTRANCE. RATIOS: 1:3—2:3—3:7—5:7 AND—7:9



DIAGRAMS ILLUSTRATING THE EMPLOYMENT OF SIMPLE RATIOS (2:3 AND 3:5) IN THE PLAN AND DESIGN OF THE ROCHESTER CHAMBER OF COMMERCE

DIAGRAMS BY CLAUDE BRAGDON SHOWING APPLICATION OF SIMPLE RATIOS IN DETERMINING PROPORTIONS OF THE ROCHESTER CHAMBER OF COMMERCE

In architecture, the most fundamental thing is *unity*. Unity is the result of a certain harmony in the relationship of parts which convinces the mind through the eye. This conviction comes most readily when the numerical ratios which express this relationship of parts are simple (of quantitatively low numbers), for then the eye has little difficulty in resolving them.

The sister art of music most admirably illustrates the close relationship between a harmony which is perceived by the senses as beauty and one which is perceived by the eye as order, for all of the principal consonant musical intervals are expressed by ratios of small quantity: 1 : 2 the octave; 2 : 3 the fifth; 3 : 4 the fourth; 4 : 5 the major third; 5 : 6 the minor third, and so on.

Applying this principle, the proportions of a room, of a façade, of an opening in the wall, to be "musical" should be capable of being expressed by simple ratios. Accordingly, in the building under discussion, the chamber room and the assembly room express, in the relation of breadth to length, the ratio 3 : 5. This ratio also expresses the principal parallelogram of the exterior in its horizontal dimensions. The two major vertical divisions of the exterior, the height from watertable to the top of the belt course at the assembly floor level, and thence upward to the cornice, are expressed by the ratio 2 : 3.

Again in the entrance, the total width is to the total height as 5 : 7, and the architectural "frame" is to the width of the opening which it frames as 2 : 3. The diagonal of the opening is parallel with the diagonal of the large parallelogram whose horizontal sides are defined by the watertable and the fascia of the cornice.

Other ratios are indicated in the accompanying diagrams, and this method of determining proportions has been used generally throughout the building.

The architecture of the building is of what may be called the usual type, conforming in general to the current conventions. Otherwise it would fail to express the conservative spirit of the organization. Yet here and there in the ornament fresh motifs have been introduced, developed from the geometry of four dimensions and from magic paths in magic squares, according to methods described in "Projective Ornament."

For example, the interlace which constitutes the plaster grilles throughout the chamber room is really a magic line of the magic square of three, developed by following with a free hand line, from square to square, the numbers in their natural order. The centerpieces in the glass ceiling lights are "tesseracts" (hypercubes) in plane projection. The pattern of the perforated marble panels which cover the radiators of the vestibule is suggested by a linear design obtained by the symmetrical juxtaposition of four hypercubes.

In studying the design of the building the architects made an interesting use of a model which holds a suggestion of value for obtaining the complete conception of a proposed building in its mass and proportions, and relation in scale to adjoining structures before actual construction. The two illustrations below show how closely actual conditions of site may be approximated. The model was built at scale to conform to the contour of the lot, and through a simple trick of the photographer's art both the model and the site were photographed at the same scale, and the photograph of the model inserted in the photograph of the site. This produced what was to all practical purposes a picture of the completed building, as comparison of the two illustrations will show. By this simple means the design was studied with as much ease and profit as the average architect does his building after it has been completed.



Illustrations of Preliminary Model and Completed Building from Similar Viewpoints



# The Statler Idea in Hotel Planning and Equipment

## II. THE DEVELOPMENT OF THE TYPICAL FLOOR PLAN

By W. SYDNEY WAGNER  
Of George B. Post & Sons, Architects

LET it not be inferred, in this discussion of the Statler idea in hotel planning and equipment, that the idea as it is known in this country today, and as exemplified in the plans of the hotel in St. Louis, sprang full grown from the mental brow of the owner. The Buffalo hotel was the embodiment of certain very definite ideas of Mr. Ellsworth M. Statler, based upon a life-long experience and study of hotel operation, as to what constituted proper hotel service. A study of the plans of the succeeding hotels of his company will show that each is a clear consecutive chapter in a long record of the constant development of these first great ruling principles. It will show that in every instance the basic ideas were sound, and that the development has been in the study and correction of the details of their application, in their ever closer coördination with the architectural principles underlying proper planning, construction, and decoration, and in their adjustment to meet varying local conditions.

The keystone of the Statler idea is *Service*. It is fully expressed in these few terse sentences from the Statler Service Code :

A HOTEL has just one thing to sell.  
That one thing is Service.

The Hotel that sells Poor Service is a Poor Hotel.

The Hotel that sells Good Service is a Good Hotel.

It is the object of Hotel Statler to sell its Guests the VERY BEST SERVICE in the world.

This idea is the ruling one from the moment of the conception of a new hotel project, and permeates the policy of construction and operation.

It is the standard by which practically every part of the plan is measured. If an analysis of each of the various parts of the plan results in an affirmative answer to the question, "Will it provide the best service?" then, and then only, is it acceptable as a solution of the particular problem involved. Any

arrangement of plan, however praiseworthy it may be architecturally, if it be essentially at variance with this idea, is rejected.

To attain this standard of service it was necessary to plan for complete coördination of the various parts of the hotel, to reduce the number of these parts to an essential minimum, and then to simplify and to standardize all of the many details of these parts, from the greatest to the most minute.

The Statler idea includes, therefore, as its dominating characteristic, the two great ideas or principles of *Simplification* and *Standardization*.

The essential parts of the hotel building can be grouped under five heads, as follows :

1. The Typical Floors, comprising the guest bedrooms and parlors.

2. The Sample Room Floors, comprising the rooms for the display of samples and for the accommodation of the merchants displaying them.

3. The Public Floors, comprising the public lobbies, dining rooms, and other rooms devoted to the general use of the public.

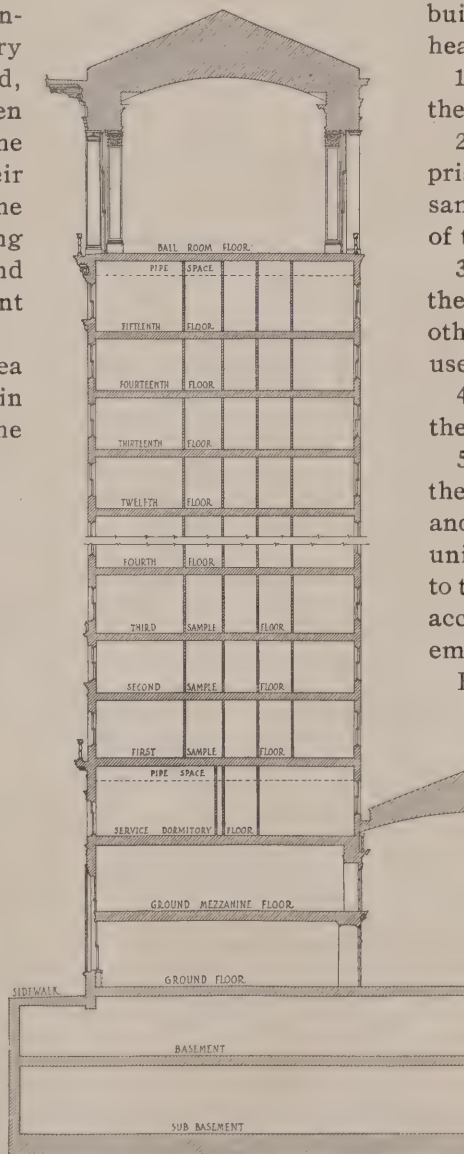
4. The Function Floor, comprising the ball rooms and banquet rooms.

5. The Service Parts, comprising the kitchen, mechanical departments, and, in short, all of the innumerable units necessary to supply the service to the other four parts, and to provide accommodations and service for the employees.

Each of the first four parts mentioned is planned to deliver to the guest a certain type of service, supplementing, yet differing from, that delivered by every other part. It cannot deliver the best service unless it is planned as a complete unit, with its boundaries well defined, and not merging with those of any other part.

This does not apply to the service parts as a whole, for its various units, functioning everywhere, will be found throughout the building.

A glance at the vertical



Section, Hotel Statler, St. Louis, Mo.

section of the St. Louis hotel will show clearly to what an extent this definition of parts is expressed in the Statler hotels. Here will be found the first great example of the idea of *Simplification*. In contrast with the usual hotel plans, where one is bewildered by a maze of jumbled units, floors at various levels, and a chaos of pipe spaces, here each of the four essential parts is contained complete in one or more floors.

This section shows several significant changes in the interrelation of these parts from that of the earlier hotels. Here the female-helps' dormitory floor has been placed directly over the two floors containing the public parts, and under the main shaft of the building formed by the sample room and typical floors. In the earlier hotels it had been the practice to place this dormitory floor at the top of the building directly beneath the roof.

The advantages of the change are many and, after discovery, obvious. It acts as a "buffer" floor between the two parts of the house. It serves the double purpose of dormitory and pipe space, as under its ceiling are located the various large trunk lines of plumbing, drainage, steam, and vacuum piping, ventilation ducts, and electric wiring, formerly placed in a five-foot-deep pipe space above the ceilings of the public rooms. The present arrangement permits of the more economical installation and repair of these lines; the danger of leakage and consequent damage to the costly decorations below is minimized, as not only will the waterproof cement floor of the dormi-

tories hold the water longer, but the fact that this floor is constantly occupied will ensure instant detection, alarm, and quick repair.

The height of the building, as is now usual in most cities, is limited by law, so the saving of height incident to this arrangement of combined pipe space and dormitory floor permits of each typical floor being a little higher from floor to ceiling, and receiving better light and air.

The typical floor is the largest single unit of the building, and as rooms constitute the most essential feature of any hotel plan, it is also the most important unit. Nowhere is the expression of the Statler idea more in evidence, more clean cut and characteristic than

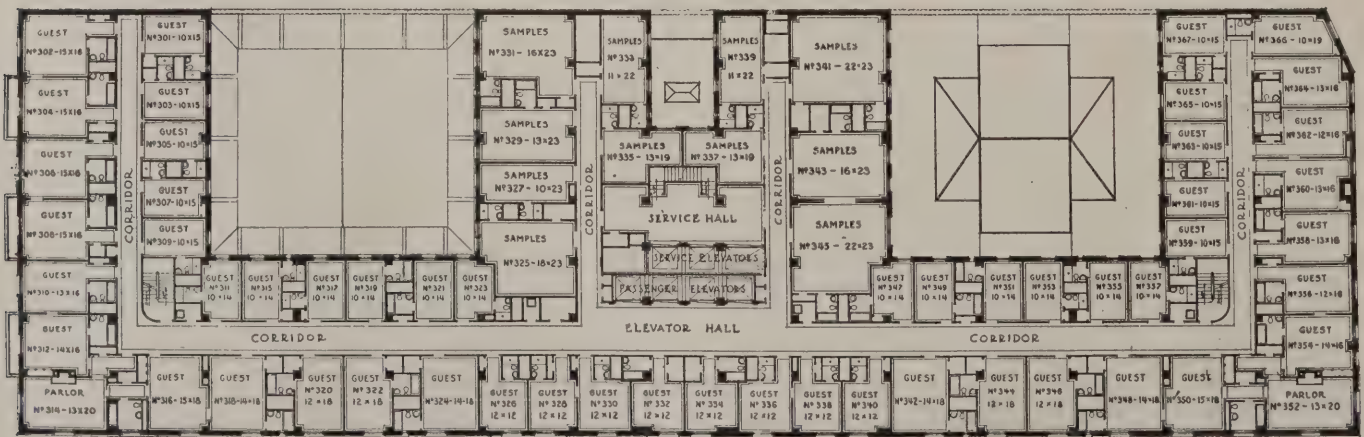
in the planning and equipment of these floors. Here will be found the greatest number of examples of the trinity of *Service*, *Simplification*, and *Standardization*.

An examination of the comparative typical floor plans of the four hotels will show the development of these ideas from the time of their first expression in the Buffalo hotel to their latest in St. Louis.

In the first hotel the passenger elevators were separated from the service elevators, but in all of the later buildings these two units were combined in one bank, as it was found that this combination provided better service to the guest through being more convenient for the employees. It brought all of the overhead traction elevator machinery under one roof and one control. On the ground floor it facilitated the service of the correlated departments of the front office, porter, and bell captain.



Typical Floor Plan, Hotel Statler, Buffalo, N. Y.  
Esenwein & Johnson, Architects



Typical Floor Plan, Hotel Statler, Cleveland, Ohio  
Geo. B. Post & Sons, Architects



After a study of many hotel plans it is apparent that it has been the usual practice in planning the typical floor, after the general arrangement of the elevators, corridors, and wings had been determined, to devote exhaustive study to the location of the structural steel columns.

Then, and then only, would the architect begin to adjust and fit the bedrooms and bathrooms around the steel columns, for all the world like a poor tailor fitting a suit of clothes. The result, as in the case of the suit, is usually disappointing.

In the planning of the hotels under discussion, this process was reversed. The rooms and bathrooms were planned in standardized double units to conform to requirements of service, and the spacings of the structural steel columns and floor beams were *then* so planned as to become part and servant of this standard arrangement.

This may have involved the use of a few additional pounds of steel. But what was the resulting gain?

A standardized unit, comprising not only the bedrooms and bathrooms, but also the very structure of the building itself, was obtained.

Great simplification in the details of this unit was then possible. The economy affected by the elimination of the many odd corners and patches of furring which were an inevitable consequence of the old method of column dodging alone more than balanced the cost of the extra weight of steel.

More rooms per floor were secured through the saving of space and the greater compactness of the unit.

The architectural expression of the hotel, always a difficult problem, was now greatly simplified. The frantic juggling of the often irreconcilable exterior and interior conditions, resulting from the old arbitrary method of steel design, became unnecessary, as now the steel structure assumed its legitimate place in the scheme of architectural design.

The writer knows whereof he speaks in this matter, for he has struggled with both methods, and the old one was simply Sherman's definition of war!

The typical floor plan of the St. Louis hotel is the latest, and consequently the best expression of the development of this standardized unit, and in this respect it is approached by no other hotel in the country.

This plan shows also the development of the Statler idea of a bathroom to every room; here even the parlors of the corner suites are supplied with bathrooms, making it possible to use the parlors as bedrooms if it should be desired.

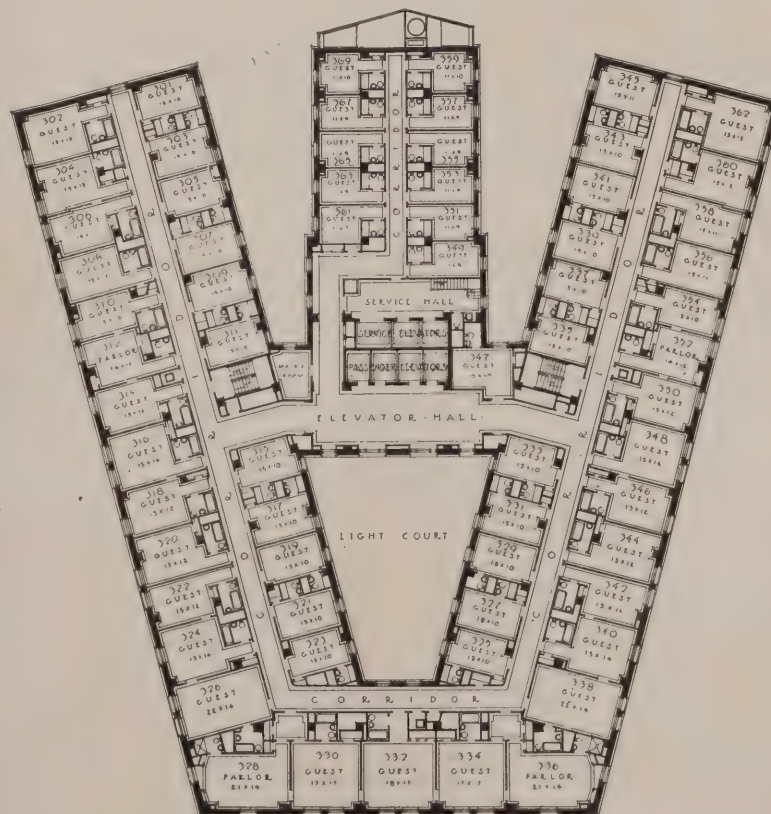
Comparison of the plans will show also the gradual adoption of the inside bathroom, until in the latest house all of them are inside, with the exception of those of the two parlor suites.

There has always been much discussion of the relative merits of the inside and the outside bathroom.

In operation it has been clearly demonstrated that in this type of hotel the well ventilated inside bathroom is far superior to the outside one. In the ventilation of the former the air is always passing *from* the bedroom by means of a small



Typical Floor Plan, Hotel Statler, St. Louis, Mo.  
Geo. B. Post & Sons and Mauran, Russell & Crowell, Associated Architects



Typical Floor Plan, Hotel Statler, Detroit, Mich.  
Geo. B. Post & Sons, Architects

space left between the bottom of the bathroom door and its saddle, through the bathroom and into the ventilation shaft by means of a register opening in the bathroom wall.

This current of air can always be maintained positive, whereas in an outside bathroom pressure of air from an open window therein will often reverse this current and force the bathroom odors into the bedroom.

The two outside bathrooms of the parlor suites were provided to meet the occasional demand for this type of bathroom—a demand made, by the way, more often by women than by men.

Another significant development has been the abandonment of the arrangement of the double bathroom unit placed *between* rooms, as shown in Scheme A, and typified in the Buffalo plan, and the general adoption of the double unit placed at the back of the bedrooms and between them and the corridor, as shown in Scheme B. The Scheme A arrangement is now used only where property or planning conditions make it necessary to secure the narrower building wing obtainable by its use.

The reasons for this adaptation of Scheme B are many.

By its use the greatest number of rooms per floor can be obtained, always an essential requirement where the height of the building and the area of the property are both limited. Any desired number of these bedrooms can be thrown *en suite*, whereas, with the former bathroom arrangement, the number was limited to two.

Its use results in a wider building wing, always more economical in construction because a minimum amount of exterior wall per bedroom is thus secured, and because, in a high building, less steel for wind bracing is required owing to the wing's greater stability.

The small vestibule between the corridor and the bedroom, created by the Scheme B arrangement, is valuable as a transitional entrance to the room, acting as a buffer between the guest and the noises and light of the public corridor at night. In it can be placed the doors to the bathroom and the clothes closet, thus screening the entrance to the bathroom

from the bedroom, and giving more wall space and the possibilities of better furniture arrangement in the bedroom.

The bathrooms are divided into two types, — tub baths for the higher priced street rooms and shower baths for the lower priced court rooms. Each of these types has been standardized into a typical unit consisting of two bathrooms with a common vent and pipe shaft between them. This shaft is always at least two feet wide and contains all of the main lines of hot and cold water supply, drainage, steam, ice water, and other piping. It serves also as the bathroom ventilation shaft, being connected with a common plenum space under the roof.

The bathroom fixtures are so placed along the wall of this shaft that instant access can be obtained to their several systems of branch piping by means of a hinged medicine cabinet and mirror frame located above the wash basin and opening into the shaft.

The radiators in the two bathrooms, as well as those in the two corresponding bedrooms, are placed on the one system of steam line in this shaft. The bathroom radiator is tucked away out of sight under the wash basin, while that in the room is located in the corner adjacent to the shaft.

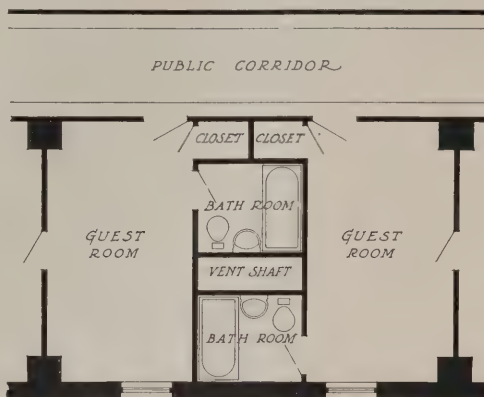
It can readily be seen that this grouping of four radiators on one steam line, in place of two as in ordinary practice, effects a great economy of installation and maintenance in a large hotel.

Endless criticism has been directed against this innovation of placing the radiator against an inside wall, yet

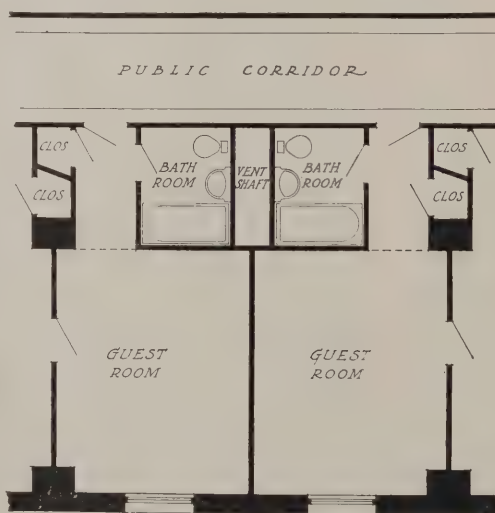
tests in the hotels have shown that, with thermostatic temperature control, there is no appreciable difference in result between this method and the one of placing the radiator under the window.

Many hotels do not provide heat in the bathroom, yet it must be of obvious importance, in these days of the all-year-round outdoor sleeping porch, that a guest, after having slept with his window wide open through the night, should be enabled to jump from his bed into a warm bathroom.

As evidence of the universal application of the

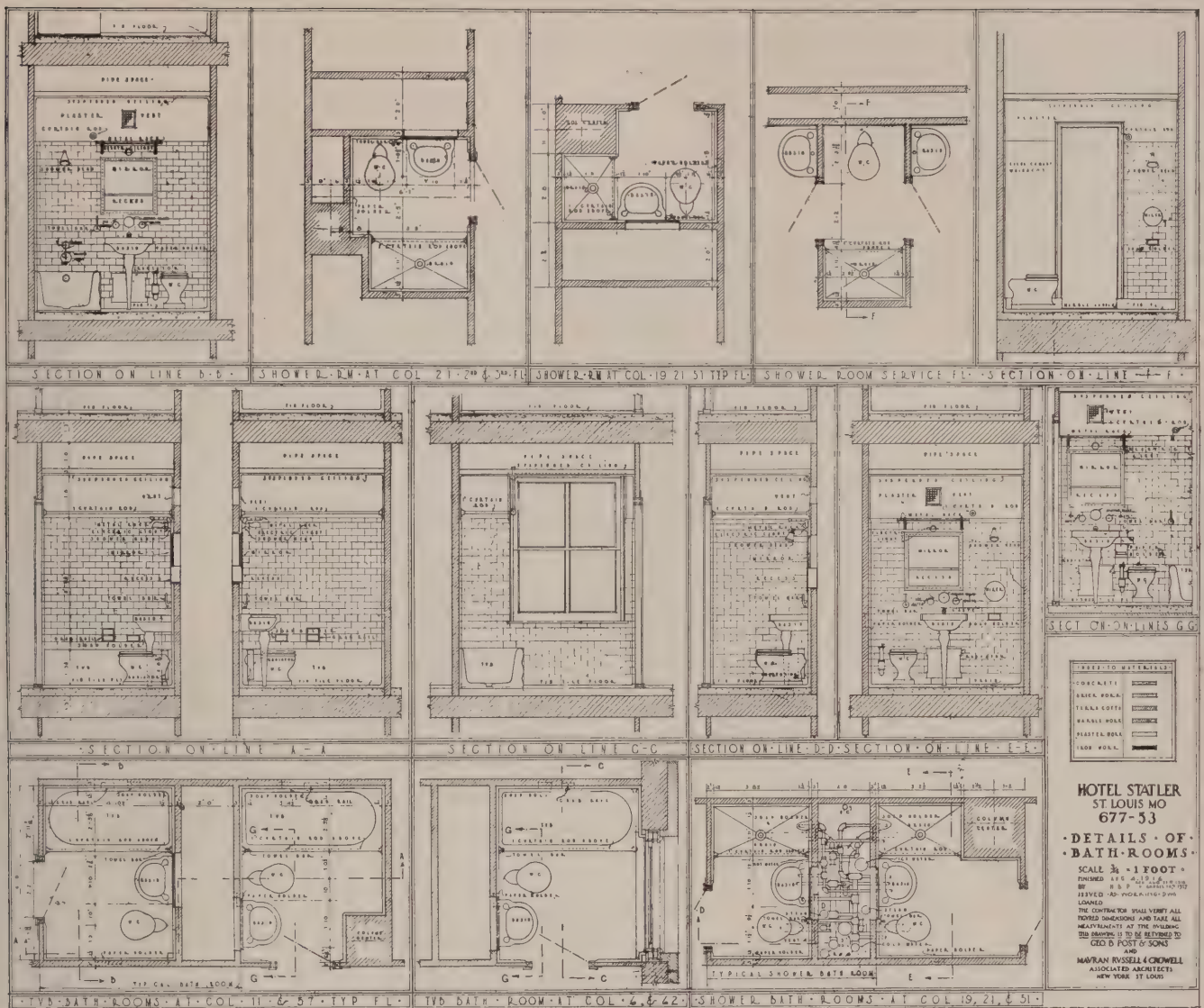


Scheme A  
Double Bathroom Unit Between Guest Rooms

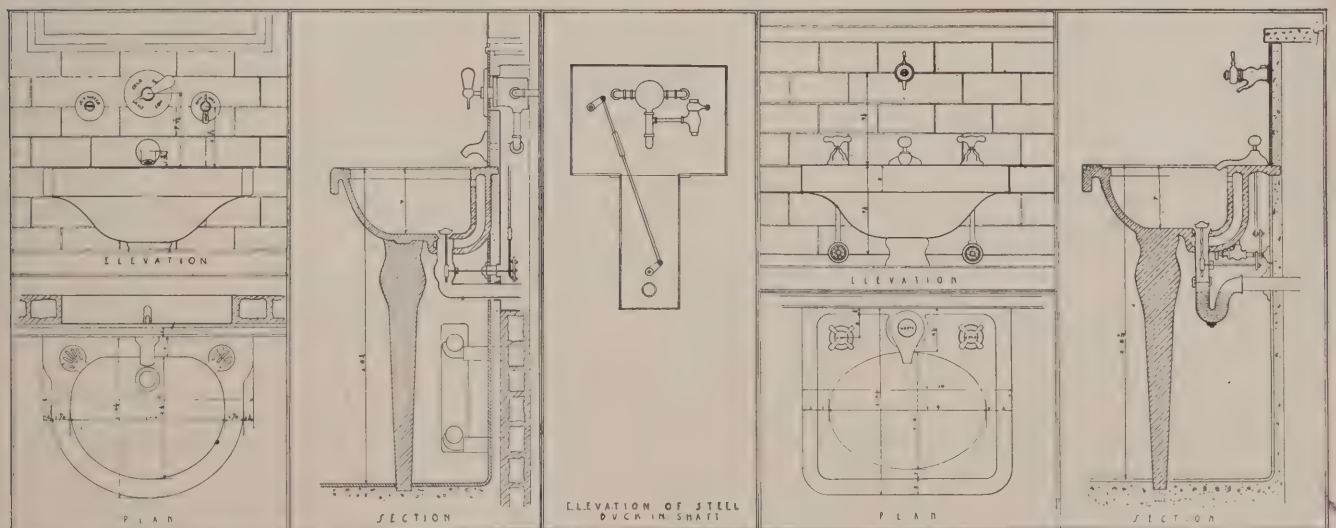


Scheme B  
Double Bathroom Unit Between Guest Rooms and Corridor





DETAIL ELEVATIONS AND PLANS OF TYPICAL BATHROOMS



DETAILS OF LAVATORY FITTINGS FOR GUEST BATHS AT LEFT AND FOR PUBLIC TOILETS AT RIGHT

HOTEL STATLER, ST. LOUIS, MO.

GEO. B. POST &amp; SONS AND MAURAN, RUSSELL &amp; CROWELL, ASSOCIATED ARCHITECTS

ruling principle of *Service*, the reproduction in these pages of the detail drawings of the standardized bathroom equipment should prove far more effective than many words. The "running ice water in every room" idea, however, is worthy of special comment, as it is one which has been in use for years in the Statler hotels, but the importance of which is only now beginning to be recognized by others. Yet its advantages over the old methods of delivering this particular service to the guest cannot be questioned. The water is at hand at the very moment the guest desires it, besides relieving him at the same time, of the irritating necessity of giving the bellboy a disproportionate tip in return for this small service. True, it does lack the anodyne advantages of "the clink of the ice in the pitcher, as the boy comes down the hall."

This is but one of the many ideas of *Service*, each one small in itself, yet in their totality forming the major portion of what is known as the "Statler Idea."

Allow me to digress for a moment from the subject proper of this discussion to mention a few of

them which have been widely commented upon.

The first that comes to mind is such an obvious one that it recalls the story of the man who exclaimed, "Why, I could have thought of that myself!" It is the revolutionary idea of placing the keyhole in the door *above* the doorknob instead of

below it, where it had nestled for centuries. There is no need to enlarge upon the many advantages of this simple idea.

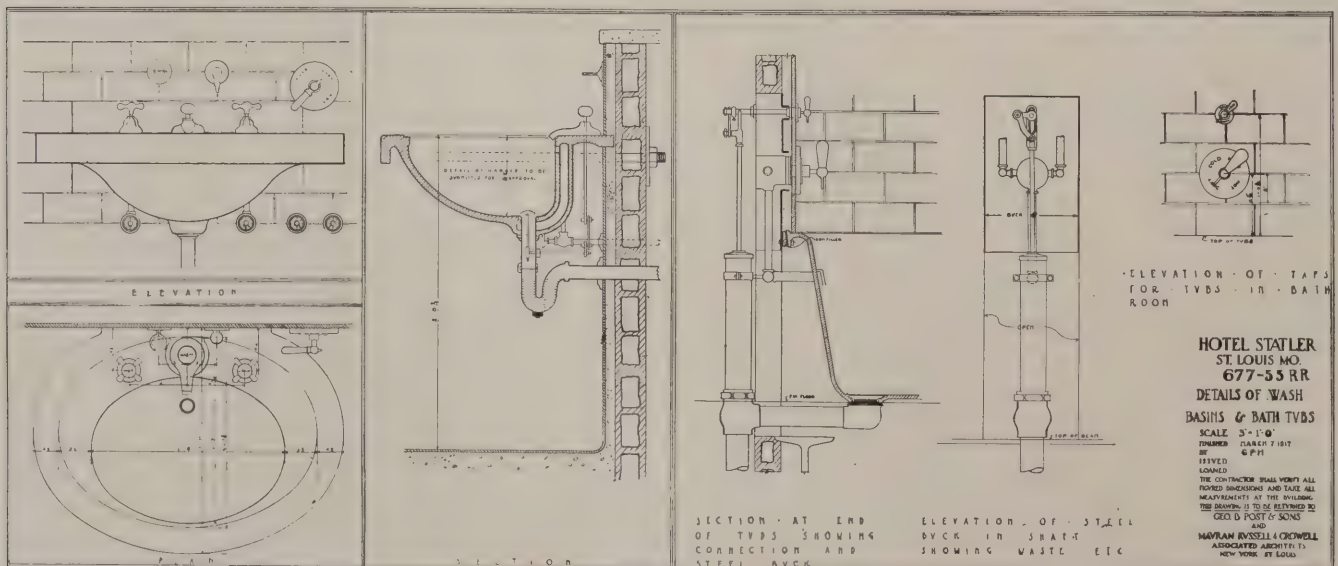
Then there is the idea of enlarging the space between the bottom of the corridor door and its saddle enough to permit of sliding under the door a copy of the morning paper, with the compliments of the hotel printed on its face. And finally, I must mention the classic Statler pin cushion found upon

the dresser of every room, and holding a full supply of first-aid material in the form of needles, thread, pins, and buttons of various sizes and uses.

These few instances are indicative of the constant efforts to give the guest ever a fuller measure of service and to realize the ideal of a complete hotel; it is their expression throughout the plan, equipment, and furnishing which make these hotels worthy of special study.



Detailed View of Typical Bathroom in Hotel Statler, St. Louis, Mo.



Detail of Fittings for Barber Shop Lavatories and Guests' Baths, Hotel Statler, St. Louis, Mo.



ROOF TRUSSES IN WIND TUNNEL BUILDING,  
MASSACHUSETTS INSTITUTE OF TECHNOLOGY

The roof, shown in detail in the accompanying drawing, is similar in contour to that adopted for aviation hangars and is supported by eleven trusses

When it is considered that it would be necessary to wait at least two weeks for gusset plates or other steel parts needed, if usual methods had been followed, and that the only material used was 2-inch hard pine planking, and  $\frac{1}{2}$  and  $\frac{7}{8}$ -inch bolts readily obtainable in any market, the saving of time in the erection of the building can be appreciated.



## EDITORIAL COMMENT

NOW, if ever, is the time when all architects, as well as all local and national societies of architects, should be using every effort to adjust themselves to the trend of the times. Few of the other professions are so intimately affected by changing conditions in the building world. None is more vitally necessary to the welfare of general business, and it is every architect's duty to prove this.

War conditions develop situations so far remote from peace times that many of the business world are slow to awake to a full realization of the needs and possibilities of the times. Architects in particular seem reluctant to grasp opportunities at their door until after some one else walks off with the prize.

Why does not the architectural profession assert itself and demand its place in the sun? Why do architects sit with folded hands while engineers assume the architectural development of the country? Why are so many of the Government buildings erected under the supervision and from the plans of men who are not practising architects? Why do private corporations employ engineers to execute commissions which could be much better done by architects? Why do legislative bodies discount the value of architects' services and minimize the importance of an architect's judgment?

When the profession awakes to a realization that these questions are real and not hypothetical; when each architect sincerely endeavors to realize the point of view which the questions represent, then, and not until then, will the answer be found, and a new spirit pervade the ranks.

The answer is in the attitude of architects toward the business world. They feel, perhaps justly, that their profession forbids any tendency to commercialize their art. Sound as such a theory may be, there is not one of the profession who realizes present conditions who does not deprecate the fact that architects are losing commissions which legitimately belong to them. Nor will this fact be changed so long as existing conditions remain in force.

We believe in architecture as a profession. We believe in the dignity inherent in anything which works to the betterment of the world and its people. We also believe that the profession represents such a wealth of mental development, such a record of marvelous achievement, not only in the realm of pure art, but also in the construction and engineering fields, that its abilities should be recognized.

The world's greatest engineering feats were accomplished by architects. The precedents from

which the engineers derive their inspirations were developed by architects. Unfortunately, however, architects have lost the confidence of the world as to their ability to initiate big projects and have been relegated to the æsthetic side of construction developments, when in the opinion of the business man such extravagance can be condoned. This is not right, and architects should see that it is corrected.

Unquestionably the results obtained by some—not architects—who have designed and built structures are not so good as might have been produced by a trained architect. They may satisfy the practical requirements; they may please the taste of the owner; they do not, however, offer so clear, coherent, artistic, or well constructed a solution of the problem as though built under the supervision of a competent trained architect.

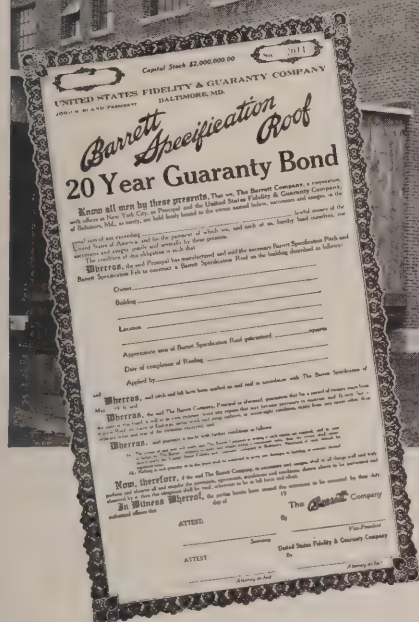
"Trained architect" embraces the knowledge of many subjects, and unfortunately there are too few who meet this standard. The majority of architects are carefully trained in design and general construction, but neglect to learn the intimate details of the other phases of building work. As a result, the experts whom architects are accustomed to consult sooner or later hire their own architectural draftsmen and assume the designing of buildings themselves.

The architects alone are to blame. They have allowed these conditions to come about through their lack of interest in the developments of the day. Now, of all time, however, must they assume a new attitude. History is being made not only by the armed artisans of war, but also by the unarmed artisans of peaceful pursuits. New ideas are coming to the fore every day, and only by being in touch with the situation can architects keep up with progress.

THE ARCHITECTURAL FORUM will make every effort to keep its readers informed of what is transpiring in the architectural field,—the emergency building program of the Government,—the part architects are taking in it,—the new construction methods that are being evolved through the scarcity of steel and the difficulties of transporting materials. These factors are influencing building construction to such an extent that during the course of the war many expedients will be adopted that will find permanent use and with which all will need to be conversant. Absorb all possible information regarding new ideas and new developments; then when peace comes, and with it a tidal wave of building operations, all who are qualified will be able to pick up important commissions without waste of time.



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# TARGET AND ARROW ROOFING TIN



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Roofed with 20,000 square feet of TARGET AND ARROW tin, by Jno. G. Hetzell & Son, roofers, Baltimore.

The roofing is applied with standing seams, giving a ribbed effect, and is painted a light gray color.

Do not overlook the possibilities of attractive color effects in using tin roofing. In the past, tin roofing was seldom thought of as having any artistic merit. Nowadays standing seam or heavy ribbed types of tin roofing, — either with large or small ribs, rounded or square — colored to harmonize with the general color scheme of the building, give a roof of character and distinction for any class of building.

The first coat of paint for a tin roof should be one of the kinds approved by the National Association of Sheet Metal Contractors, *i.e.*, metallic brown, Venetian red, red oxide or red lead, with pure linseed oil and very little, if any, dryer. Over this first coat any color can be applied,

for instance, a gray lead color, to simulate the weather-beaten appearance of the lead roofs of old English cathedrals; a light green to give the appearance of old copper, or a nut brown color for a remarkably rich effect. For a red brick building, try dull green or soft gray. Even if the entire roof of the building is of some other material, such as slate, tile, etc., the tin flashings, open valleys, etc., should be painted to harmonize in color with the rest of the roof.

A good tin roof deserves a coat of paint every four or five years to repair the ordinary wear and tear of the weather, and to keep it in perfect condition. This repainting also affords an opportunity to freshen up the color.

A list of color suggestions is given on "Service Sheet," No. 4, Index No. 18, issued by the Architectural Service Corporation of Philadelphia.

Description of this product will be found in Sweet's Architectural Catalog — all editions.

**N. & G. TAYLOR CO., Philadelphia**

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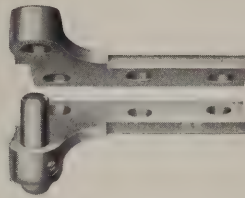
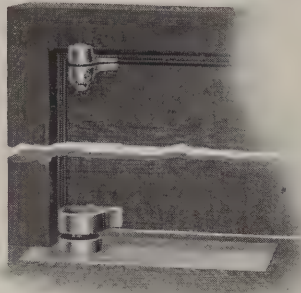
*10 Factories — Branches in 56 Large Cities*



# **RUSSWIN CHECKING FLOOR HINGES**

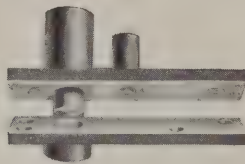
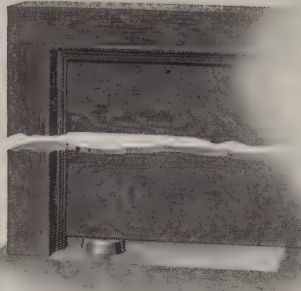
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SINGLE AND DOUBLE  
ACTING DOORS**



*Rim Pivot*

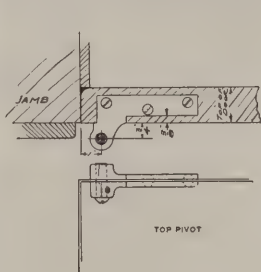
*Single Acting Hinge No. 13, Applied*



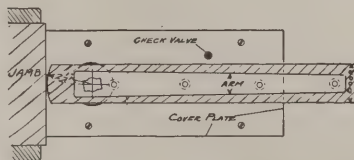
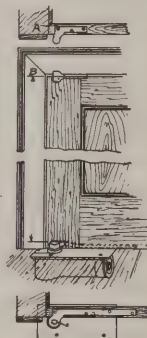
*Mortise Pivot*

*Double Acting Hinge Applied*

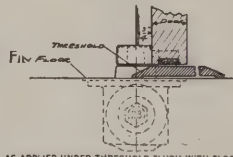
## **DETAILS FOR APPLICATION, HINGE No. 13**



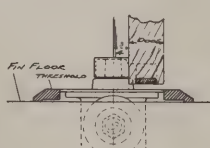
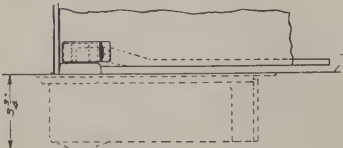
TOP PIVOT



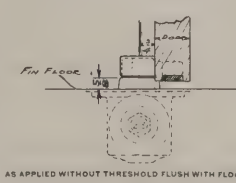
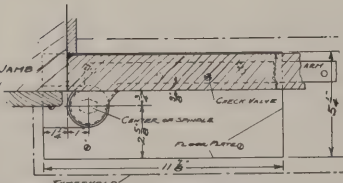
AS APPLIED CENTRALLY ON JAMB WITH ARM IN CENTER OF DOOR



AS APPLIED UNDER THRESHOLD FLUSH WITH FLOOR



AS APPLIED FLUSH WITH TOP OF THRESHOLD

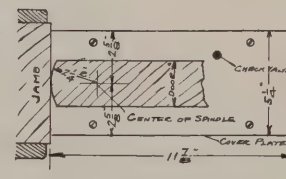
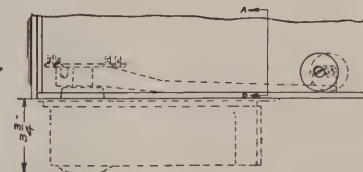
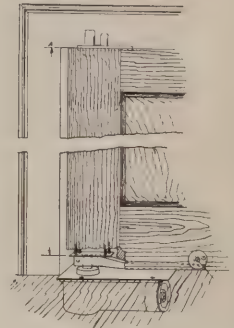


AS APPLIED WITHOUT THRESHOLD FLUSH WITH FLOOR

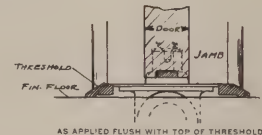
## **DETAILS FOR APPLICATION, HINGE No. 23**



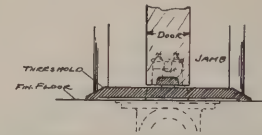
TOP PIVOT



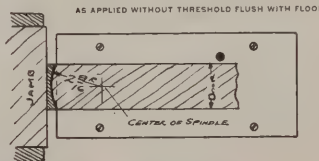
APPLICATION TO JAMB WITHOUT HANGING STRIP



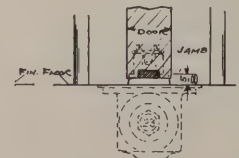
AS APPLIED FLUSH WITH TOP OF THRESHOLD



AS APPLIED UNDER THRESHOLD FLUSH WITH FLOOR



APPLICATION TO JAMB WITH HANGING STRIP



## **RUSSWIN CHECKING FLOOR HINGES**

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Double Acting. Without Side Plates, No. 23. With side plates, No. 123.

These hinges are suitable for Heavy Entrance or Vestibule Doors, not exceeding 3 feet in width. Single acting hinges can be applied flush with floor, or threshold, or under the threshold and hung flush with casing or in the center of the jamb. For hinges to be applied in center of jamb specify No. 13 CT; for application under the threshold specify No. 13 T.

Double acting hinges can be applied flush with floor, or threshold, or under the threshold, centered on the jamb. For hinges to be applied under threshold specify No. 23 T or 123 T. Size of case: Length, 11 7/8"; width, 5 1/4"; height, 3 3/4". Specify Hand of Door on single acting hinges.



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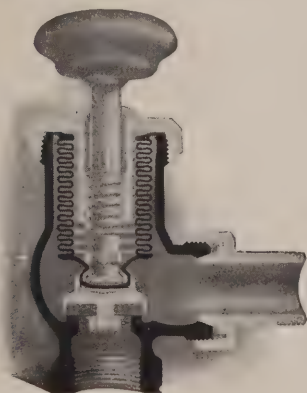
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# Selected List of Manufacturers' Publications

FOR THE SERVICE OF ARCHITECTS, ENGINEERS, AND CONTRACTORS

The publications listed in these columns are the most important of those issued by manufacturers represented in the advertising pages of THE ARCHITECTURAL FORUM. They may be had upon direct application to the manufacturers.

## ARCH CONSTRUCTION, TIMBREL TILE

**Guastavino Co., R.**, Fuller Building, New York, N. Y.  
Portfolio. 10½ x 13½ in. Plates.

## BRICK

**American Enameled Brick and Tile Co.**, 52 Vanderbilt Avenue, New York.  
Enameled Brick. Catalog. 6 x 9½ in. 25 pp. Color plates.  
**Hydraulic-Press Brick Co.**, St. Louis.  
Bonds and Mortars in the Wall of Brick. Treatise on brick design. 8½ x 11½ in. 27 pp.  
Brick Scales and Tables. Fifteen scales for vertical and horizontal measurements, with explanatory booklet and tables. 8 x 10 in. 32 pp.  
Moulded and Ornamental Brick. Catalog. 4½ x 6½ in. 140 pp.  
The Brick Church and Parish House. Book of designs with floor plans from drawings submitted in competition. 10½ x 13½ in. 80 pp.  
**Sayre & Fisher Co.**, 261 Broadway, New York.  
Brick — Enameled and Front. Catalog. 6 x 9 in. 24 pp. Color plates.  
Everything in Brick. Illustrated. Folder. 7¾ x 9 in.  
**Western Brick Co.**, Danville, Ill.  
The Art of Stippling. Brochure giving history of development of stippling and its application to face brick. 4 x 6 in. 24 pp.  
Where Western Brick Were Used, 1914-1915. Booklet. 4½ x 6 in. 30 pp.

## BUILDING MATERIALS

**Johns-Manville Co., H. W.**, Madison Avenue, New York.  
J-M Building Materials. Booklet. 3½ x 6 in. 24 pp.

## CEMENT, PORTLAND

**Atlas Portland Cement Company, The**, 30 Broad Street, New York.  
Handbook and Treatise. Concrete in Factory Construction. 6½ x 8¾ in. 250 pp.  
Early Stucco Houses, with modern stucco specifications. Booklet. 8½ x 11 in. 24 pp.  
Choosing the Garage, describing actual construction. Booklet. 8 x 10½ in. 26 pp.  
Commercial Garages, with construction notes and architectural treatment. Booklet. 8 x 10½ in. 12 pp.  
Color Tones in Stucco. Booklet with colored plates. 8½ x 11 in. 24 pp.  
Building a Bungalow. Booklet. 8½ x 11 in. 18 pp. 4 color plates.  
Concrete on the Farm. Handbook with useful data. 8 x 10½ in. 98 pp.  
**Lehigh Portland Cement Co., The**, Allentown, Pa.  
Forty-one Concrete Reasons. Booklet. 6 x 9 in. 34 pp.  
Cement Facts. Booklet. 5¼ x 6¼ in. 18 pp.  
The Expense-Proof Farm. Booklet. 6 x 9 in. 100 pp.  
Lehigh Portland Cement. Illustrated. Booklet. 8¼ x 12½ in. 42 pp.  
**Sandusky Cement Co., The**, Dept. S., Engineers Building, Cleveland, Ohio.  
Medusa White Portland Cement. Booklet. 8½ x 11 in. 52 pp.  
Medusa Waterproofed White Portland Cement. Booklet. 6 x 9 in. 20 pp.  
Medusa Waterproofed Gray Portland Cement. Booklet. 6 x 9 in. 20 pp.

## CHIMNEYS

**Heinicke, Inc., H. R.**, 147 Fourth Avenue, New York.  
Chimneys. Bulletin. Methods of construction.

## CLOCKS, TOWER

**Thomas Clock Co., Seth**, 19 West 44th Street, New York.  
Descriptive catalog with complete data. 8 x 10½ in. 80 pp.

## CONDUIT

**National Metal Molding Co.**, 1113 Fulton Building, Pittsburgh.  
Handbook on National Metal Molding. Complete details and installation instructions. 4¼ x 6 in. 96 pp.  
Bulletin No. 101. National Metal Moldings and Fittings. 8½ x 10 in. 32 pp.

## CONSTRUCTION, FIREPROOF

**General Fireproofing Co., The**, Youngstown, Ohio.  
Fireproofing Handbook. 6 x 9 in. 112 pp.  
**Trussed Concrete Steel Co.**, Steel Building, Dept. 57, Youngstown, Ohio.  
Truscon Steel Buildings. Catalog containing details and full information. 8½ x 11 in. 24 pp.  
Kahn Building Products. Catalog containing tables, details, and complete information. 6 x 3½ in. 100 pp.

## CONVEYORS, GRAVITY

**Otis Elevator Company**, Eleventh Avenue and 26th Street, New York.  
Otis Gravity Conveyors. Catalog. 6 x 9 in. 56 pp.

## DOORS, WINDOWS, AND TRIM, METAL

**Detroit Steel Products Co.**, 3117 East Grand Boulevard, Detroit, Mich.  
The Fenestra Line. Catalog. 8½ x 11 in. 15 sections. Blue prints.  
**Lupton's Sons Co., David**, Witte and Tulip Streets, Philadelphia, Pa.  
Lupton Service and Products. No. 9. Descriptive catalog with drawings and data for specifications. 8½ x 11 in. 100 pp. and cover.  
Air, Light, and Efficiency. Booklet. Daylight illumination as practised in the modern factory building. 6 x 9 in. 50 pp.  
**Merchant & Evans Co.**, Philadelphia.  
Red Book. Catalog. 5½ x 8¼ in. 190 pp.  
**Trussed Concrete Steel Co.**, Steel Sash, Dept. 57, Youngstown, Ohio.  
United Steel Sash. Catalog. Details and specifications. 8½ x 11 in. 128 pp.

## DUMBWAITERS

**Sedgwick Machine Works**, 182 Liberty Street, New York.  
Service Sheets. Standard specifications, plans, etc. 16½ x 21½ in.

## ELECTRICAL EQUIPMENT

**Hart & Hegeman Mfg. Co., The**, 346 Capitol Ave., Hartford, Conn.  
Catalog O. H & H Switches and Paiste Wiring Material. 9 x 10½ in. 106 pp.  
**Hart Mfg. Co.**, Hartford, Conn.  
"Diamond H" Switches and Receptacles. Descriptive booklet. 4 x 8½ in. 24 pp.

## ELEVATORS

**Otis Elevator Company**, Eleventh Avenue and 26th Street, New York.  
Otis Electric Traction Elevators. Bulletin. 6 x 9 in. 28 pp.  
Otis Residence Elevators. Bulletin. 6 x 9 in. 16 pp.  
**Sedgwick Machine Works**, 182 Liberty Street, New York.  
Selecting an Invalid Elevator. Booklet. 4¼ x 8¼ in. 8 pp.

## ESCALATORS

**Otis Elevator Company**, Eleventh Avenue and 26th Street, New York.  
Otis Escalators. Bulletin. 6 x 9 in. 36 pp.

## FAIENCE, ARCHITECTURAL

**Rookwood Pottery Co.**, Cincinnati.  
Faience Catalog with portfolio of plates. 9½ x 12½ in. 64 pp.

## FLOORING

**Armstrong Cork & Insulation Co.**, 132 24th St., Pittsburgh.  
Linotile Floors. Booklet. 6 x 9 in. 32 pp.  
**Kennedy, Inc., David E.**, 55 Fifth Avenue, New York.  
Nonpareil Cork Tile. Booklet showing patterns. 3½ x 5½ in. 34 pp.  
Folder showing colors of tiles. 3½ x 5½ in. 4 pp.  
Everlastic Tile. Folder. 3¼ x 6¼ in. 4 pp.  
Mas-Oleum Floor. (Mastic Linoleum.) Folder. Specification forms. 7½ x 9 in. 4 pp.  
**Sonneborn Sons, Inc., L.**, Dept. 4, 264 Pearl Street, New York.  
Lapidolith Specifications. Booklet. 8½ x 10½ in.  
Scientific Investigation of the Action of Lapidolith on Concrete by Prof. R. J. Colony. Booklet.

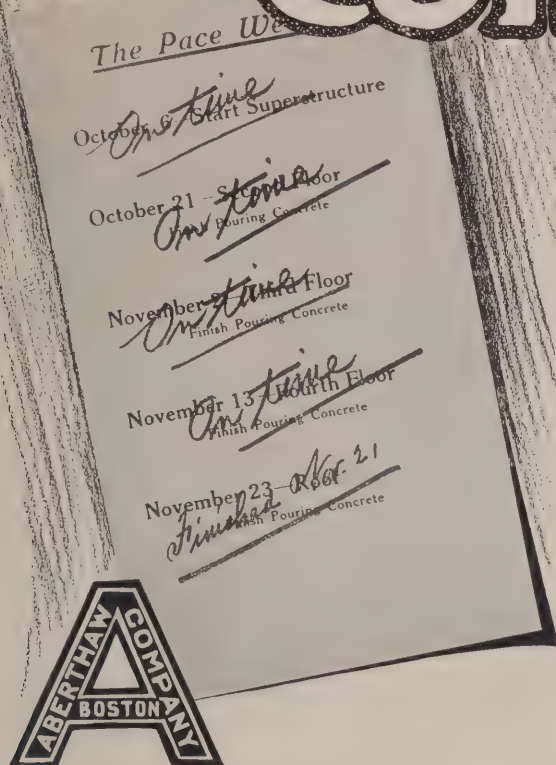
## GARDEN POTTERY — See Pottery, Garden.

## GLASS CONSTRUCTION

**Berger Manufacturing Co.**, Canton, Ohio.  
Berger's Raydiant Sidewalk Lights. Catalog T. F. 8½ x 11 in. 42 pp.  
**Keppeler Glass Constructions Inc.**, Architects Building, 101 Park Avenue, New York.  
Bulletin No. 126. 8½ x 11½ in. 12 pp.  
Bulletin No. 202. 9 x 12 in. 6 pp.  
Bulletin No. 203. 9 x 12 in. 4 pp.  
Bulletin No. 205. 9 x 12 in. 6 pp.



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## The Colt's Patent Fire Arms Mfg. Co., Hartford, Conn.

were *confident* that the Organization which had furnished another building for them a few months previously could duplicate their performance, *perhaps even more rapidly*—so they *again* called on the

### Aberthaw Company, Boston, Mass.

The Aberthaw Company were *confident* that there was *one* Organization which would not fail them in *delivery* of the necessary 30,000 barrels of cement, in its uniform *quality*—so they called on

### The Giant Portland Cement Company

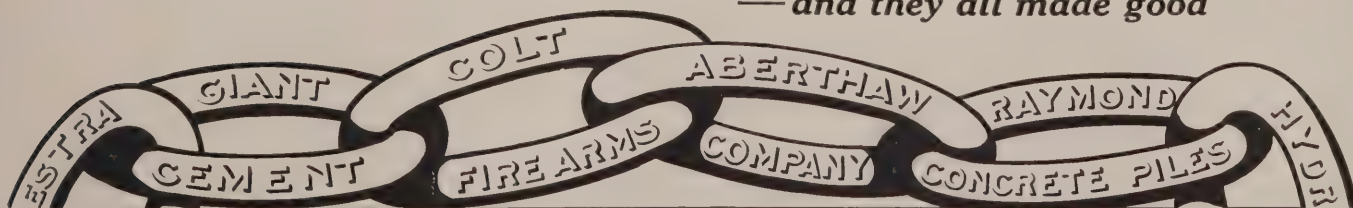
30 Church Street, New York City

The Aberthaw Construction Company were *confident* that there was *one* Concrete Pile Organization that would make a flying start and get the necessary 1400 Piles driven in record time—so they called on the

### Raymond Concrete Pile Co.

New York: 140 Cedar Street

—and they all made good



SELECTED LIST OF MANUFACTURERS' PUBLICATIONS — *Continued from page 22*

## HARDWARE

- Columbian Hardware Co., The**, Cleveland, Ohio.  
Making It Easier to Buy Columbian Sash Pulleys. Folder.  
3¼ x 8¼ in. 14 pp.
- Corbin, P. & F.**, New Britain, Conn.  
Colonial Hardware. Booklet. 5 x 7 in. 32 pp.  
Corbin Door Checks. Catalog. 5 x 7 in. 40 pp.  
Corbin Door Knockers. Booklet. 5 x 7 in. 24 pp.  
General Catalog. 10½ x 13 in. 1200 pp.
- Russell & Erwin Mfg. Co.**, New Britain, Conn.  
General Catalog. 9 x 12 in. 1250 pp.  
Russwin Period Design Booklet. 6 x 8 in. 72 pp.  
Russwin Fire Exit Bolt Catalog. 6 x 9 in. 46 pp.  
Russwin Casement Window Hardware. Booklet. 6 x 9 in. 32 pp.
- Stanley Works, The**, New Britain, Conn.  
Wrought Hardware. Catalog. Describing wrought steel hinges, butts and door bolts. 6½ x 10 in. 260 pp.  
Stanley's Wrought Steel Garage Door Hardware. Booklet. 3½ x 6¼ in. 8 pp.  
Properly Hung Doors. Booklet. 5 x 7½ in. 16 pp.  
"Stanley" Sherardizing. Descriptive booklet. 3½ x 6¼ in. 4 pp.
- Vonnegut Hardware Company**, Indianapolis.  
Prince Self-Releasing Fire Exit Devices. Catalog with drawings and tables. 8 x 11 in. 36 pp.  
Von Duprin Self-Releasing Fire Exit Devices. Catalog 12-F. 8 x 11 in. 45 pp.
- Wilkins, George Lester**, 7079 North Clark Street, Chicago.  
Casement Adjuster Data Sheets. Details and full information regarding Wilkins and Security Casement Adjusters. 8½ x 11 in. 12 pp.
- Yale & Towne Mfg. Co.**, 9 East 40th Street, New York.  
Builders' Locks and Hardware. Catalog No. 22. 9 x 12 in. 350 pp.  
Door Closing Devices. Folder Catalog. 6½ x 3½ in. 8 pp.

## HEATING EQUIPMENT

- American Blower Co.**, Detroit, Mich.  
"A B C" Heaters. Bulletin. 8½ x 11 in. 24 pp.  
Vento Cast-Iron Hot-Blast Heater. Bulletin. 8½ x 11 in. 44 pp.
- American Radiator Co.**, 816 South Michigan Avenue, Chicago.  
The Ideal Fitter. Handbook of heating and ventilating specification data. 6½ x 3¼ in. 336 pp.  
Ideal Smokeless Down Draft Boilers. Booklet. 8½ x 11 in. 24 pp.
- Boynton Furnace Co., The**, 106 West 37th Street, New York.  
Square Pot Heaters. Catalog. 7 x 9¼ in. 60 pp.
- Crane Co.**, 836 South Michigan Avenue, Chicago.  
Steam Goods. Complete pocket catalog. 4½ x 6 in. 775 pp.
- Gorton & Lidgerwood Co.**, 96 Liberty Street, New York.  
Modern House Heating. Catalog No. 88. 4¼ x 7 in. 32 pp.
- Jenkins Bros.**, 80 White Street, New York.  
Catalog and Price List. 4 x 6¼ in. 256 pp.
- Kelsey Heating Co., Inc., The**, 238 James Street, Syracuse, N. Y.  
Architects' Portfolio. 12 plates showing plans, heating, specifications, and layouts. 8½ x 11 in.  
Kelsey System of Heating and Ventilating. Booklet. 36 pp.  
Kelsey Warm Air Generators. Booklet. 32 pp.
- Lord & Burnham Co.**, 42d Street Building, New York.  
Burnham Boilers. Catalog No. 56. 4 x 10 in. 19 pp.
- United States Radiator Corporation**, Detroit.  
A Modern "House Warming." Booklet. 6 x 9 in. 30 pp.  
The "Complete Line." Technical data. Catalog. 4¼ x 7¼ in. 270 pp.

## HOISTS

- Gillis & Geoghegan**, 544 West Broadway, New York.  
The G & G Telescopic Hoists (all models). Bulletin. 8½ x 11 in. 16 pp.  
The G & G Standard 17 x 24 in. Hoisting Cans with Side Handles and Swing Bails. Booklets A and B. 16 pp.

## HOLLOW TILE — See Tile, Hollow

## INSULATION

- Armstrong Cork & Insulation Co.**, 132 24th Street, Pittsburgh.  
Nonpareil Corkboard Insulation. Scientific treatise. 6 x 9 in. 130 pp.  
Nonpareil High Pressure Covering. Scientific treatise. 6 x 9 in. 84 pp.
- Cabot, Inc., Samuel**, 141 Milk Street, Boston.  
Service Sheets. Details of Construction and Methods of Using Cabot's Quilt. 16½ x 21½ in.
- Johns-Manville Co., H. W.**, Madison Avenue, New York.  
J-M Insulating Materials. Booklet. 3½ x 6 in. 24 pp.
- Magnesia Association of America**, 702 Bulletin Building, Philadelphia, Pa.  
Let 85% Magnesia Defend Your Steam. A handbook of heat insulation. Magnesia specifications.

## JOISTS AND STUDS, PRESSED STEEL

- Berger Manufacturing Co.**, Dept. L. F., Canton, Ohio.  
Metal Lumber. Series of technical bulletins 12F especially prepared for architects. 8½ x 11 in. 32 pp.  
Ribplex. Bulletin No. 14. 8½ x 11 in. 4 pp.
- Trussed Concrete Steel Co.**, Dept. B-57, Youngstown, Ohio.  
Kahn Pressed Steel Construction. Catalog. Complete details and specifications. 8½ x 11 in. 32 pp.

## LATH, METAL

- Berger Manufacturing Co.**, Canton, Ohio.  
Berger's Expanded Metal Lath. Booklet. 3½ x 6 in. 44 pp. Supplement. 24 pp.
- Bostwick Steel Lath Co.**, Niles, Ohio.  
Stucco on Truss Loop Metal Lath. Treatise. 6 x 9 in. 16 pp.  
Typical specifications. Standard specifications forms for stucco on metal lath.
- General Fireproofing Co., The**, Youngstown, Ohio.  
Herringbone Rigid Metal Lath. A complete catalog on Herringbone Metal Lath. 6 x 9 in. 32 pp.
- North Western Expanded Metal Co.**, 934 Old Colony Building, Chicago, Ill.  
Kno-Burn Expanded Metal Lath. Treatise on metal lath, with details and specifications. 6 x 9 in. 52 pp.  
"Chanelath" Handbook. Treatise on ribbed metal lath details and specifications of its application to reinforced concrete construction and for plastering. 6 x 9 in. 64 pp.  
Designing Data for Reinforced Concrete Construction. Treatise on type of construction and application of expanded metal for reinforcement.
- Trussed Concrete Steel Co.**, Dept. H-57, Youngstown, Ohio.  
Hy-Rib Handbook. Specifications. 5½ x 7¼ in. 142 pp.
- Wright Wire Co.**, Worcester, Mass.  
General Catalog. Description and full particulars of wire lath, wire fencing, ornamental iron work, elevator cabs, railings, partitions, and grille work. 6 x 9 in. 224 pp.  
Wire Lath. Booklet L. Shows where Wright wire lath has been used. 3½ x 6¼ in. 16 pp.

## LIGHTING EQUIPMENT

- Ivanhoe-Regent Works of General Electric Co.**, Cleveland.  
Regent Semi-Indirect Lighting Bowls. Catalog No. 108. 8 x 10½ in. 48 pp.  
Holophane Prismatic Reflectors and Fittings. Catalog No. 800. 4 x 7 in. 50 pp.  
Ivanhoe Metal Reflectors and Fittings. Catalog No. 303. 4 x 7 in. 50 pp.  
Rozelle Color-Decorated Bowls and Shades. Catalog No. 235. 8 x 10½ in. 16 pp.
- Luminous Unit Co.**, St. Louis.  
Brascolite — The Modern Semi-Indirect Lighting System. Catalog No. 5. 8¼ x 10¼ in. 24 pp.  
Brascolite Data. Scientific data sheets. Portfolio. 9 x 11½ in. Blue prints.  
Agiltes. Folder catalog. All-glass lighting fixtures. 5¼ x 8 in. 8 pp.
- National X-Ray Reflector Co.**, 243 West Jackson Boulevard, Chicago.  
Engineering Data Book. Technical handbook. 6 x 9 in. 125 pp.  
Illumination from Concealed Sources — How to Plan and Specify Indirect Lighting. Scientific treatise. 12 x 15 in. 52 pp. 36 detail drawings.
- St. Louis Brass Mfg. Co.**, St. Louis.  
"Concealite" Catalog A. Lighting fixtures for auditoriums, banks, show windows, etc., from concealed or semi-concealed sources. 7½ x 10½ in. 20 pp.

## METAL LATH — See Lath, Metal

## METAL TRIM — See Doors, Windows, and Trim, Metal

## METAL WORK, ORNAMENTAL

- Polachek Bronze and Iron Co., John**, 480-494 Hancock Street, Long Island City, N. Y.  
Distinctive Metal Work. Booklet. 8½ x 11 in. 6 pp.
- Smyser-Royer Company**, 1225 Race Street, Philadelphia, Pa.  
Portfolio illustrating standards and other exterior lighting fixtures in bronze and iron. 4½ x 10¼ in. 175 plates.
- Tuttle & Bailey Mfg. Co.**, 52 Vanderbilt Avenue, New York.  
Special Designs of Grilles and Screens in Bronze, Brass, Iron, and Steel. Catalog No. 66A. 6½ x 10 in. 40 pp.
- Williams, Inc., John**, 556 West 27th Street, New York.  
The Art of the Bronze Founder. Illustrated lecture delivered by William Donald Mitchell. 50 pp.
- Winslow Bros. Company**, 4600-4700 West Harrison Street, Chicago.  
P. O. Box No. 803.  
Ornamental Iron and Bronze. Illustrations of completed work. 8½ x 11 in. 300 pp.

## OFFICE SUPPLIES, ARCHITECTS'

- Dixon Crucible Co., Joseph**, Dept. 224-J, Jersey City, N. J.  
"Eldorado" — The Master Drawing Pencil. Booklet.

## ORNAMENTS, PLASTIC

- Jacobson & Company**, 241 East 44th Street, New York.  
Architectural and Decorative Ornaments. Catalog. 9¼ x 12¼ in. 192 pp.

## PAINTINGS

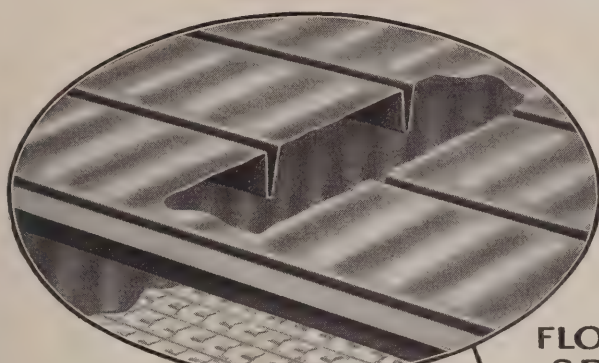
- The Ehrich Galleries**, 707 Fifth Avenue, New York.  
Catalog of Old Masters. Photos and descriptive text.

## PAINTS, VARNISHES, AND WOOD FINISHES

- Berry Bros.**, Detroit, Mich.  
Natural Woods and How to Finish Them. Complete varnish specifications. 8½ x 11 in. 94 pp.  
Luxeberry Cement Coating. Color card. 3½ x 8½ in. 3 pp.



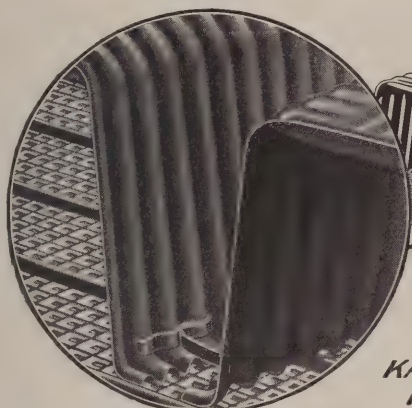
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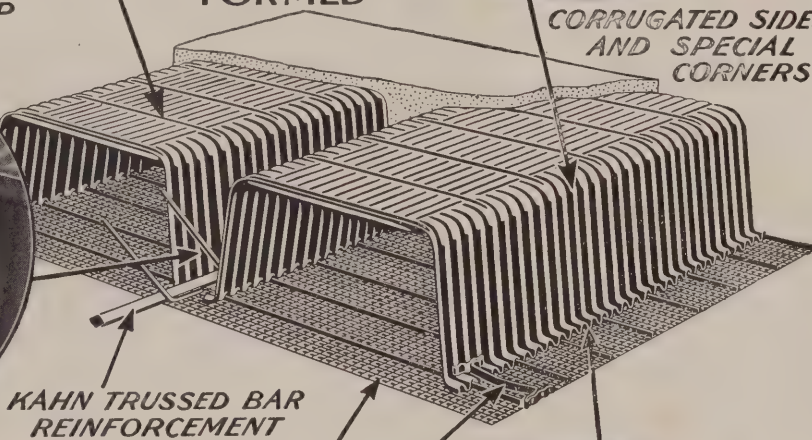
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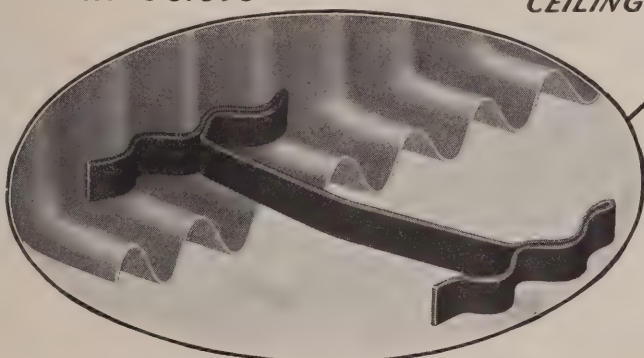


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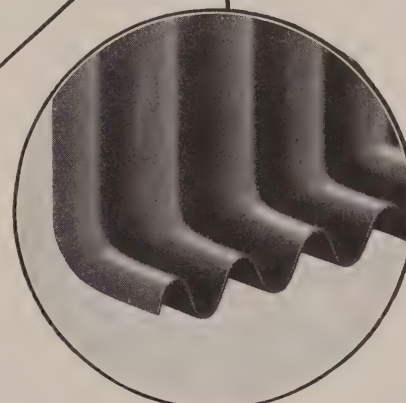


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## SELECTED LIST OF MANUFACTURERS' PUBLICATIONS—Continued from page 24

## PAINTS, VARNISHES, AND WOOD FINISHES—Continued

- Boston Varnish Co.**, Everett Station, Boston.  
Kyanize Enamel. Specifications. Booklet. 5 x 7 in. 20 pp.  
Kyanize White Enamel. Directions. Circular. 3½ x 6 in. 8 pp.  
Price List of Varnishes and Enamels. 3½ x 6 in. 24 pp.
- Dixon Crucible Co., Joseph**, Dept. 224-J, Jersey City, N. J.  
Philosophy of Protective Paint. 3¼ x 6¼ in. 24 pp.
- Lowe Bros. Co., The**, 101 Park Ave., New York and Dayton.  
Architects' Mellotone Handbook. 3 x 8 in. 27 pp. Color plates.  
High Standard Paint and Varnish Specifications. Handbook.  
4½ x 7 in. 70 pp.  
Paint and Painting. Directions and data. 5 x 9 in. 30 pp.  
Varnish and Varnishing. Treatise. 5 x 9 in. 44 pp.
- Murphy Varnish Co.**, Newark, N. J.  
The House that Found Itself. Booklet. 6¼ x 9¼ in. 28 pp.  
Harmony in Interior Decoration. Booklet. 5¼ x 8¼ in. 56 pp.  
Dealer's Descriptive List. Booklet. 4½ x 6¼ in. 28 pp.  
Beautiful Boats and How to Care for Them. Booklet. 5¼ x 8¼ in. 50 pp.
- O'Brien Varnish Company, The**, 49 Washington Street, South  
Berd, Ind.  
Specification Data. Information concerning O'Brien line of  
varnishes and interior finishes. 8½ x 11 in.
- Smith & Co., Edward**, P. O. Box 1780, New York.  
Architects' Handbook. Specifications. 5 x 7½ in. 24 pp.
- Toch Brothers**, Dept. 97, 320 Fifth Avenue, New York.  
Specifications for Damp-proofing, Waterproofing, Enameling,  
and Technical Painting. 8½ x 11 in. 48 pp.  
Toch Brothers Preservative Paints and Compounds. Booklet.  
5½ x 8¼ in. 36 pp.
- Wadsworth, Howland Co., Inc.**, 139 Federal Street, Boston.  
Bay State Finishes. Stains, and Varnishes. Catalog No. 10.  
Color cards.

## PARTITIONS, FOLDING AND ROLLING

- Folding Partition Co., Inc.**, 200 Broadway, New York, N. Y.  
Sectionfold Partitions. Catalog with detail sheet. 20 x 27 in.

## PILES

- MacArthur Concrete Pile and Foundation Co.**, 120 Broadway,  
New York.  
The Pedestal Pile. Catalog. Engineering data. 6 x 9 in. 64 pp.
- Raymond Concrete Pile Co.**, 140 Cedar Street, New York.  
Raymond Concrete Piles. Catalog. 8½ x 11¼ in. 56 pp.

## PIPE

- Byers Company, A. M.**, 235 Water Street, Pittsburgh.  
Bulletin No. 26. Tables and Specifications. Bulletin (2d Edition,  
Enlarged and Revised). 8½ x 11 in. 24 pp.  
Bulletin No. 27. The Experience of Practical Men. 8½ x 11 in.  
40 pp.  
On the Trail of Byers Pipe. Booklet. 4 x 6¼ in. 46 pp.  
Selection of Pipe for Modern Buildings. Booklet of special inter-  
est to architects. 4 x 6 in.
- Central Foundry Company**, 90 West Street, New York.  
Soil Pipe and Fittings. Catalog. 4 x 7½ in. 88 pp.  
The Lynn Drain Trap. A leaflet containing description.  
Combination Vent, Revent, and Drainage Fittings. Catalog.  
4¼ x 6¾ in. 183 pp.
- National Tube Company**, Frick Building, Pittsburgh, Pa.  
Shelby Mechanical Tubing. Booklet. 3½ x 6 in. 35 pp.  
Boiler Tubes List No. 6, 1916. Booklet. 4 x 6½ in. 16 pp.  
Pipe List No. 5, 1913. Booklet. 4 x 6½ in. 20 pp.  
National Bulletins, Nos. 1 to 27, inclusive. 8½ x 11 in.  
National Pipe Standards. Booklet. Appendix to 1913 edition.  
Tables and Useful Information Pertaining to Tubular Goods.  
4 x 6½ in. 400 pp.  
National Bulletin No. 25. National Pipe in Large Buildings.  
Booklet. Twenty years' progress in building construction, pipe  
specifications, engineering data from National Book of Stand-  
ards and illustrations of many prominent "National"-ized  
buildings. 8½ x 11 in. 88 pp. 222 illustrations.  
The Modern Boiler Tube. Booklet. Describes material, tests,  
and specifications. 7¾ x 8¾ in. 40 pp. 4 illustrations.

## PLASTER

- Hydrated Lime Bureau of the National Lime Manufacturers' Association**, 1506 Arrott Bldg., Pittsburgh.  
Standard Specifications for Hydrated Lime Plastering. Pam-  
phlet E. 6¼ x 9¼ in. 20 pp.  
Better Plastering and Better Acoustics. Bound booklet. 6¼ x 9¼ in. 40 pp.
- Kelley Island Lime & Transport Co.**, Cleveland, Ohio.  
Specifications for Hydrated Lime Plastering. Booklet. 6 x 9 in.  
20 pp.  
Hydrated Lime Plaster. Booklet. 6¼ x 9¼ in. 12 pp.  
The Perfect Finishing Lime. Booklet. 4½ x 7¼ in. 34 pp.  
The Inside Walls. Booklet. 3¼ x 6¼ in. 8 pp.

## PLUMBING EQUIPMENT

- Crane Co.**, 836 South Michigan Avenue, Chicago.  
Plumbing Catalog. 9 x 12 in. 834 pp.
- Kohler Co.**, Kohler, Wis.  
Kohler Catalog. Cloth bound. 9½ x 11½ in. 164 pp.  
Kohler of Kohler Book. Catalog. 5½ x 8 in. 68 pp.
- Standard Sanitary Mfg. Co.**, Dept. 4, Pittsburgh, Pa.  
"Standard" Catalog. General catalog of "Standard" line.  
9 x 12 in. 676 pp.  
"Standard" Plumbing Fixtures for the Home. Catalog.  
Factory Sanitation. Catalog and scientific treatise. 9 x 12 in.  
36 pp.
- Trenton Potteries Co.**, Trenton, N. J.  
Bathrooms of Character. Booklet. 4 x 7¼ in. 48 pp.  
Sanitary Pottery. Monthly house organ. 6 x 9 in. 16 pp. Color  
plates.

## POTTERY, GARDEN

- Atlantica Terra Cotta Company**, 1170 Broadway, New York.  
Garden Pottery. Catalog. 9 x 12 in. 12 pp.

## PUMPS

- Goulds Manufacturing Co.**, Seneca Falls, N. Y.  
All Types of Centrifugal and Reciprocating Power Pumps.  
Bulletins. 22 sections. 7¾ x 10 in. Bound in 8½ x 11 in. cover.  
Handy Data on Power Pumping. Bulletin 112. 7¾ x 10 in. 24 pp.

## ROOFING

- American Sheet & Tin Plate Co.**, Frick Building, Pittsburgh.  
Copper—Its Effect Upon Steel for Roofing Tin. Scientific treatise. New edition. 8½ x 11 in. 24 pp.  
Pocket Reference Book. 2½ x 4¼ in. 168 pp.
- Barrett Company, The** (formerly The Barrett Mfg. Company).  
17 Battery Place, New York City.  
Barrett's Specification Roofs—20-Year Guaranty Bond. Loose-  
leaf specifications with details. 8½ x 14 in.  
Foundation Waterproofing. Loose-leaf specifications. 8½ x 14 in.  
Tylake Shingles with Red or Green Crushed Slate Surface. For  
residences, etc. Descriptive booklet. 6 x 8 in.  
Velvex Creosote Shingle Stains. Descriptive folder showing  
colors on wood. 3½ x 6½ in.
- Boyle & Co., Inc., John**, 112-114 Duane Street, New York.  
Opinions of Practical Builders. Instructions for using Bayonne  
Roof and Deck Cloth. Book S. 3½ x 6 in. 24 pp.
- Carey Co., The Philip**, Lockland, Cincinnati.  
Architects' Book of Carey Roofing Specifications.
- Creo-Dipt Co.**, 1025 Oliver Street, North Tonawanda, N. Y.  
Service Sheet 1. No. 28. Working Drawings of Construction  
of "Thatch" Roof. Standard specifications and instructions  
for design and construction of same. 16½ x 21½ in.
- General Slate Company**, 200 Devonshire Street, Boston.  
General Slate Company—Roofing Slate. Booklet. 6 x 9 in. 16  
pp.
- Johns-Manville Co., H. W.**, Madison Avenue, New York.  
J-M Corrugated Asbestos Roofing. Catalog. 6 x 9 in. 32 pp.  
J-M Transite Asbestos Shingles. Catalog. 6 x 9 in. 32 pp.
- Ludowici-Celadon Company**, 104 South Michigan Avenue,  
Chicago.  
Roofing Tile. A detailed reference for architects. 9¼ x 13½ in.  
106 pp.  
Roofing Tile Catalog. 3¼ x 9 in. 10 pp.  
The Roof Beautiful. Booklet. 6¼ x 9¼ in. 40 pp. Color plates.  
Why Tile Is Best. Booklet. 3¼ x 6¼ in. 8 pp.
- Taylor Co., N. & G.**, 300 Chestnut Street, Philadelphia.  
A Guide to Good Roofs. Booklet. 3¼ x 5½ in. 24 pp.  
Selling Arguments for Tin Roofing. Booklet. 6 x 9¼ in. 80 pp.  
Service Sheets. Working drawings showing details of con-  
struction of heavy ribbed and standing seam tin roofing; also  
color suggestions for tin roofs and tables of covering capacity  
of tin. 16½ x 21½ in.  
Standard Specifications for Tin Roofing Work. 7½ x 9 in.

## SCREENS, WINDOW

- Empire Rolling Screen Co., Inc.**, Chamber of Commerce Bldg.,  
Rochester, N. Y.  
Fli-Bac. Booklet illustrating and describing improved window  
screens. 4 x 9 in. 8 pp.

## SHELVING, STEEL

- Lupton's Sons Co., David**, Witte and Tulip Streets, Philadelphia.  
Lupton Steel Shelving. Descriptive catalog. 6 x 9 in. 34 pp.

## STONE

- Indiana Limestone Quarrymen's Association**, P. O. Box 505,  
Bedford, Ind.  
Indiana Limestone Booklet. General treatise. 6 x 9 in. 40 pp.  
Indiana Limestone Booklet. Bank Buildings. 6 x 9 in. 40 pp.  
\$12,000 House of Indiana Limestone. (Prize, mention, and other  
drawings submitted in competition with report of Jury.) 11 x  
14 in. 46 pp.

## STORE FRONTS

- Detroit Show Case Co.**, 467 Fort Street, West, Detroit, Mich.  
Metal Store Front Construction. Handbook. 8¼ x 11 in. 32 pp.  
With full size blue print details. 16½ x 22 in. folded to 8¼ x 11 in.
- Kawneer Manufacturing Co.**, Niles, Mich.  
Architects' Portfolio of Details. 17 full size construction plates,  
loose leaf. 34 x 44 in. Also 17 half size construction plates,  
bound. 8½ x 11 in.
- New Jersey Terra Cotta Co.**, Singer Building, New York.  
Store Fronts in Architectural Terra Cotta. Booklet with designs  
and details. 8½ x 11 in. 24 pp.

## STUCCO BOARD

- Bishopric Manufacturing Co., The**, 910 Este Avenue, Cincinnati,  
Ohio.  
The Bishopric Mastic Products. Booklet. 6 x 9¼ in. 24 pp.  
Color plates.  
Built on the Wisdom of Ages. Booklet showing methods of  
using Bishopric Stucco Board. 8½ x 11 in. 48 pp.  
Service Sheets. 16½ x 21½ in.





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SELECTED LIST OF MANUFACTURERS' PUBLICATIONS — *Continued from page 26*

## TELEPHONE SYSTEMS, INTERIOR

**Western Electric Co.**, 195 Broadway, New York.  
Western Electric Interphone Specifications. Handbook. 8½ x 11 in. 41 pp.

## TERRA COTTA, ARCHITECTURAL

**American Terra Cotta & Ceramic Co.**, 2010 Peoples' Gas Building, Chicago.  
Specifications for Architectural Terra Cotta and Details of Construction. 14 plates.  
**Atlantic Terra Cotta Co.**, 1170 Broadway, New York.  
Atlantic Terra Cotta. Monthly publication. 9 x 12 in. 12 pp.  
**Conkling-Armstrong Terra Cotta Co.**, Philadelphia.  
Ornament and Details of Construction. Catalog. 9½ x 13 in.  
**Midland Terra Cotta Co.**, 1515 Lumber Exchange Building, Chicago.  
Stock Terra Cotta. Loose-leaf portfolio. 10 x 15 in. 15 plates.  
**New Jersey Terra Cotta Co.**, Singer Building, New York.  
The Victoria Building. Booklet. 8½ x 11 in. 10 pp.  
**New York Architectural Terra-Cotta Co.**, 401 Vernon Avenue, Long Island City, N. Y.  
Architectural Terra Cotta. Booklet. 8 x 8½ in. 36 pp.  
**Northwestern Terra Cotta Co.**, The, 2525 Clybourn Avenue, Chicago.  
Architectural Terra Cotta. Booklet. Showing illustrations of buildings and details. 8½ x 11 in. 60 pp.  
**South Amboy Terra Cotta Co.**, 150 Nassau Street, New York.  
Plates of Ornamental Detail and Construction. Portfolio.

## TILE, HOLLOW

**National Fire Proofing Co.**, 602 Federal Street, Pittsburgh.  
Builders' Handbook. Details of construction. 8½ x 11 in. 34 pp. Blue prints.  
Bulletin No. 172. Industrial Housing.  
Standard Hollow Tile Fireproof Construction. Bulletin No. 171. Details, tables, tests. 8½ x 11 in. 32 pp. Color plates.  
Natco on the Farm. (1917 edition.) Catalog. 8½ x 11 in. 40 pp.

## TILE, STEEL

**General Fireproofing Co., The**, Youngstown, Ohio.  
Steel-Tile Handbook. Tables, formulas, specifications, etc., for tile floors and concrete work. 6 x 9 in. 32 pp.  
**Trussed Concrete Steel Co.**, Dept. R-57, Youngstown, Ohio.  
Florestyle Construction. Booklet containing table and full information for specifying. 8½ x 11 in. 16 pp.

## UPHOLSTERY FABRICS

**Chase & Co., L. C.**, 89 Franklin Street, Boston.  
Chase Mohair Velvets. Booklet. Description of fabrics with color reproductions. 9½ x 12½ in. 10 pp.  
Chase Leatherwove. Folder. Descriptive of material and its uses. 3½ x 6½ in.

## VACUUM CLEANERS

**Western Electric Co.**, 195 Broadway, New York.  
Western Electric Vacuum Cleaner. Specifications. Bulletin. 8½ x 11 in. 62 pp.

## VENETIAN BLINDS

**Wilson Corporation, The J. G.**, 8 West 40th Street, New York.  
The Lighting and Ventilation of Modern Buildings. Treatise with working drawings. 8½ x 11 in. 12 pp.  
Leaflet No. 5. Light Diffusion.

## VENTILATION

**American Blower Co.**, Detroit, Mich.  
American Sirocco Fans and Blowers. Bulletin. 8½ x 11 in. 52 pp.  
**American Radiator Co.**, 816 So. Michigan Avenue, Chicago.  
"A B C" Steel Plate Fans. Bulletin. 8½ x 11 in. 28 pp.  
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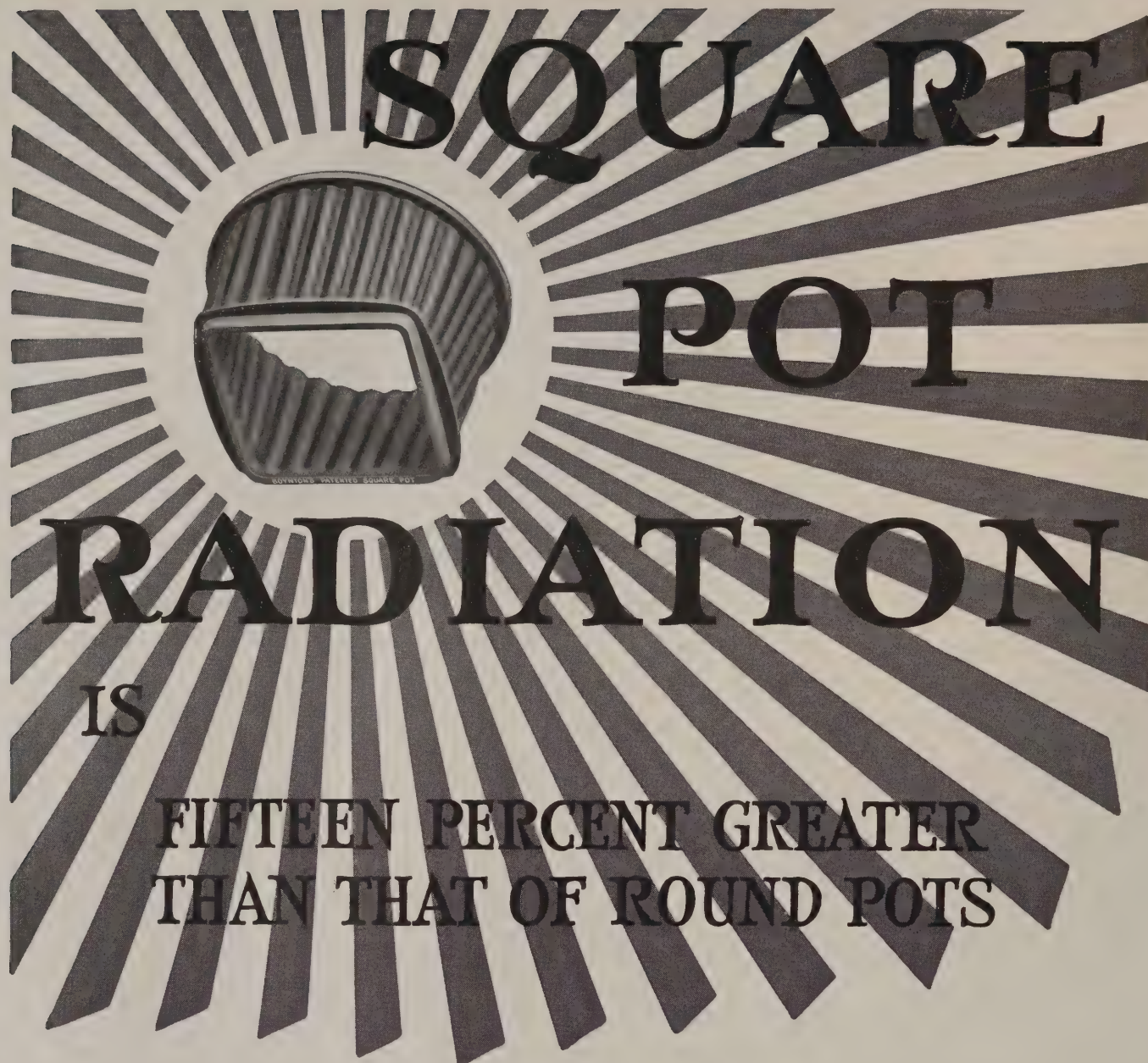
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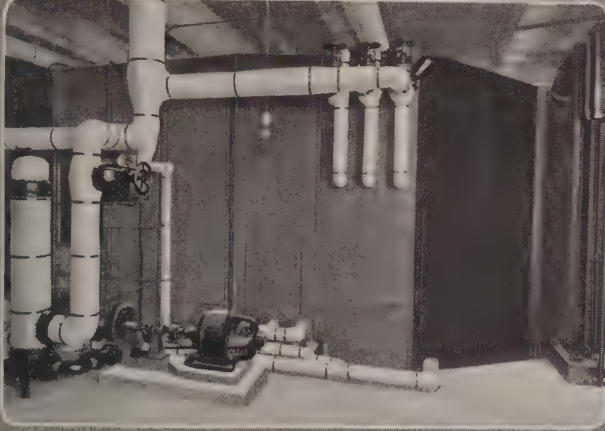
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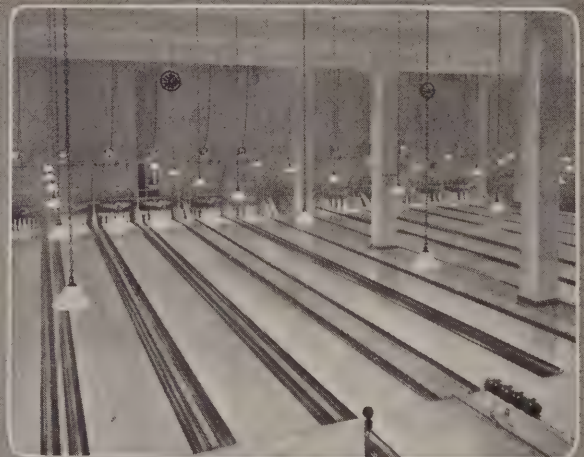
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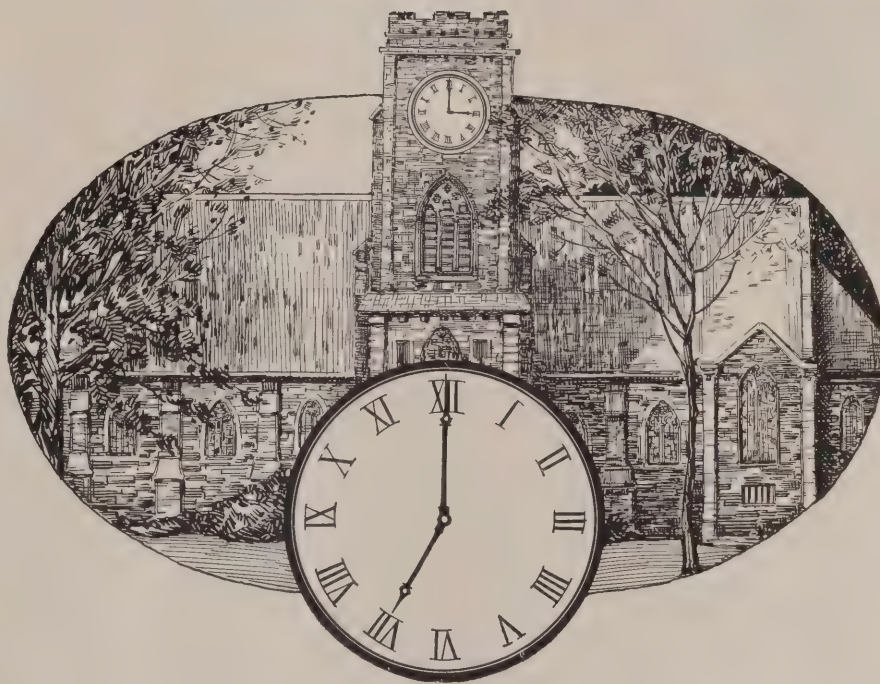
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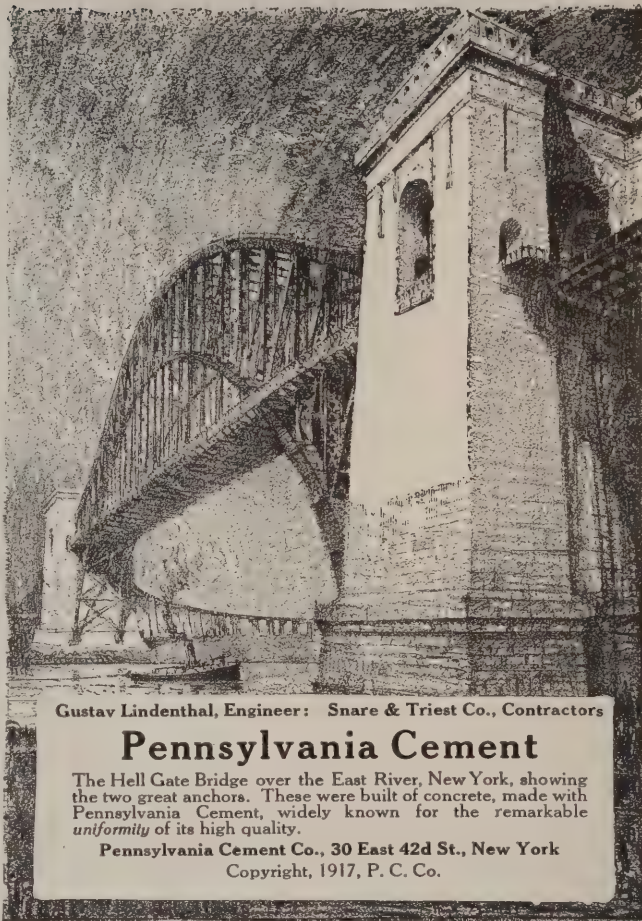
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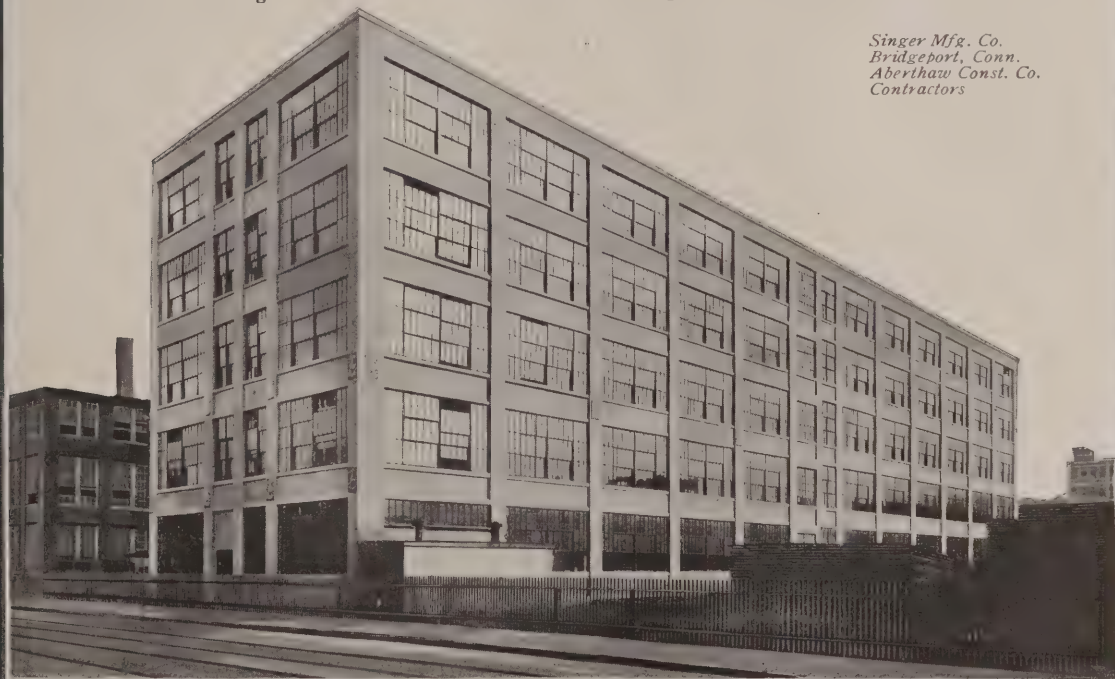
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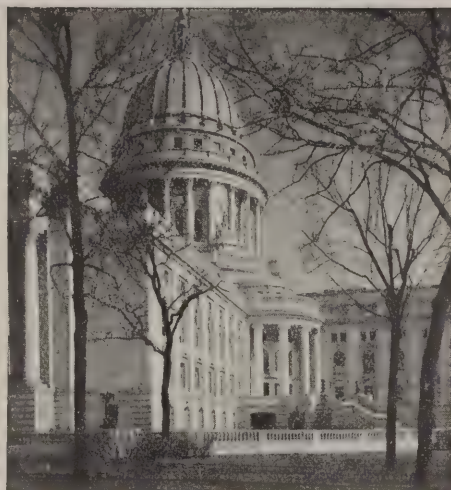
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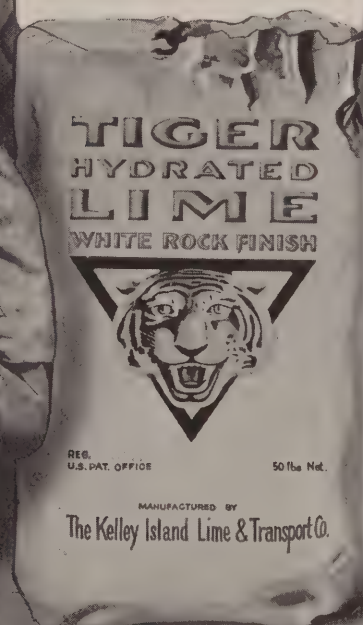
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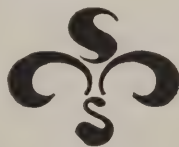
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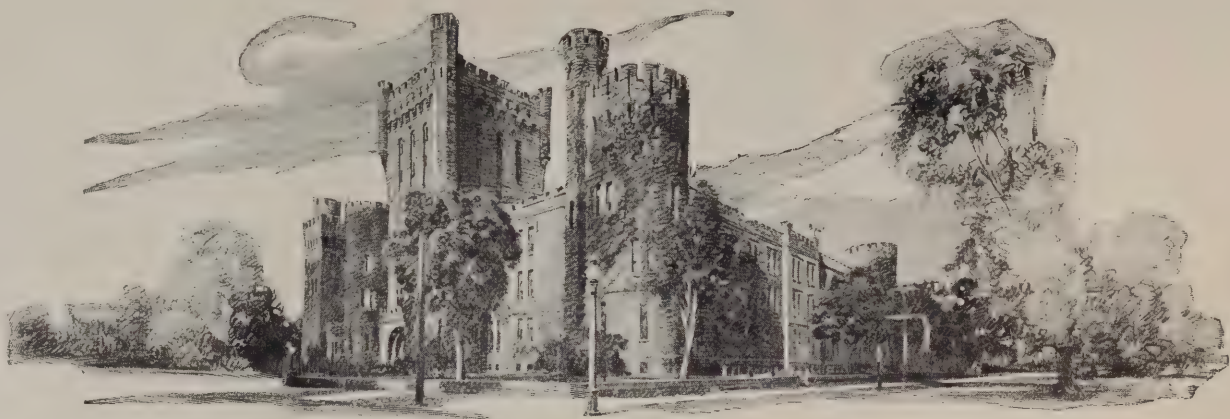
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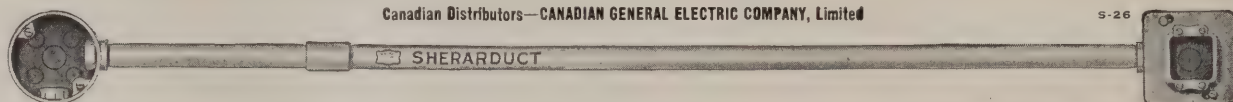
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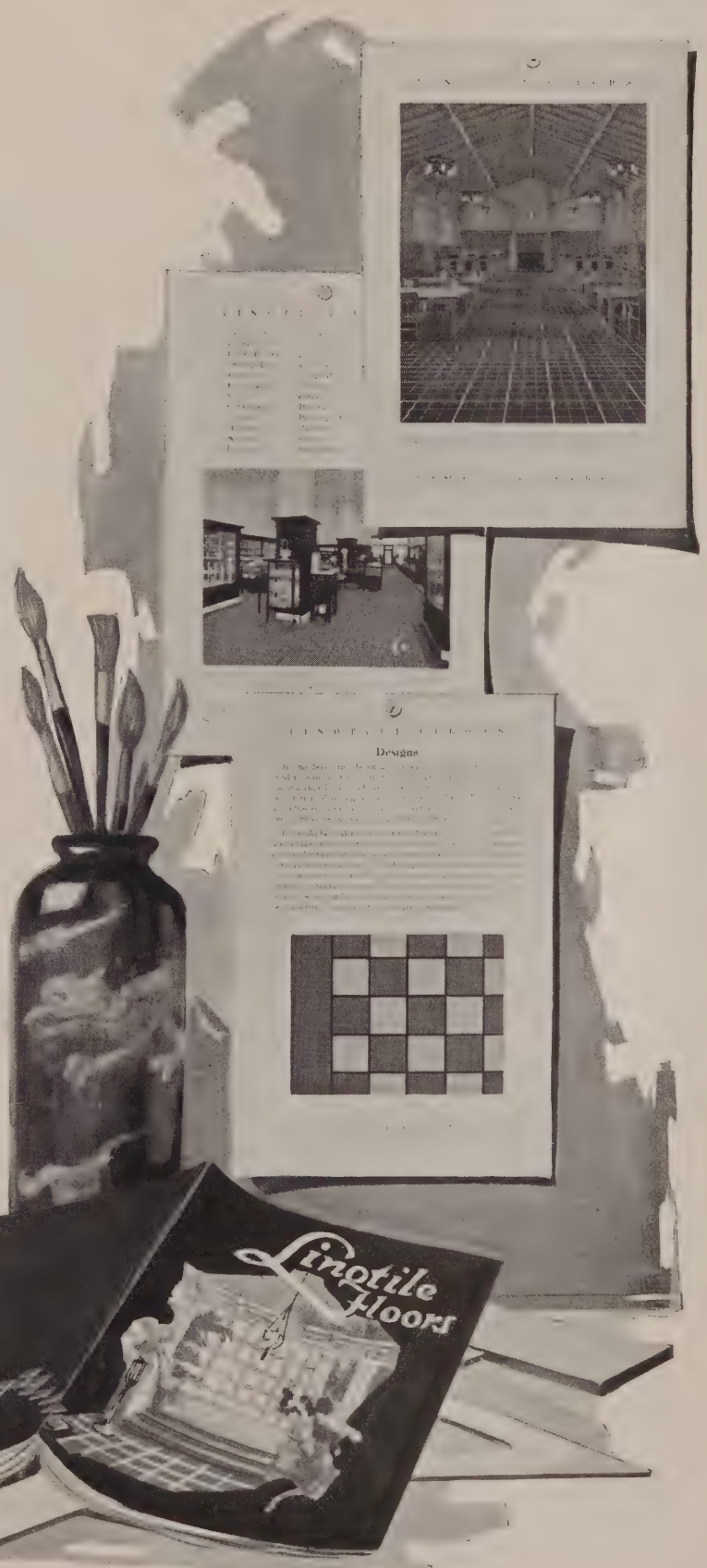
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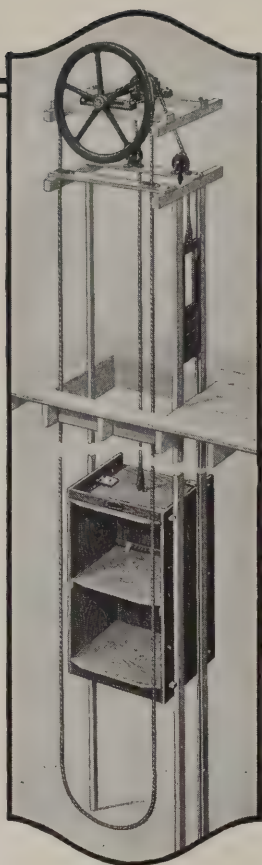
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*The Sedgwick catalog describes all standard and special types*

**SEDGWICK MACHINE WORKS**

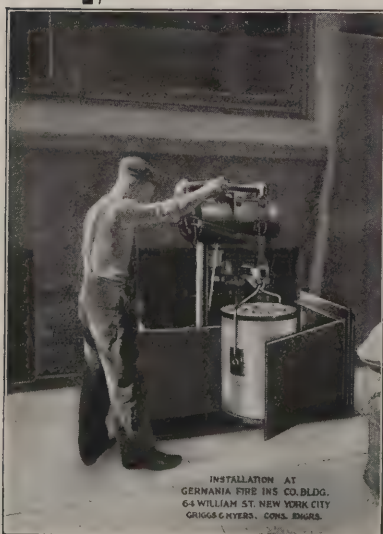
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HAND POWER ELEVATORS AND DUMBWAITERS EXCLUSIVELY

## Have You Provided An Expedient Means of Ash Removal?

### A G & G Telescopic Hoist Will Take Care of This Problem



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A G & G Telescopic Hoist is the most efficient apparatus for raising filled ash cans from cellar to sidewalk.

G & G Hoists are built to be operated by one man. They embody every conceivable feature which tends to lessen the task of ash removal and to make the operation a clean, quick and noiseless one.

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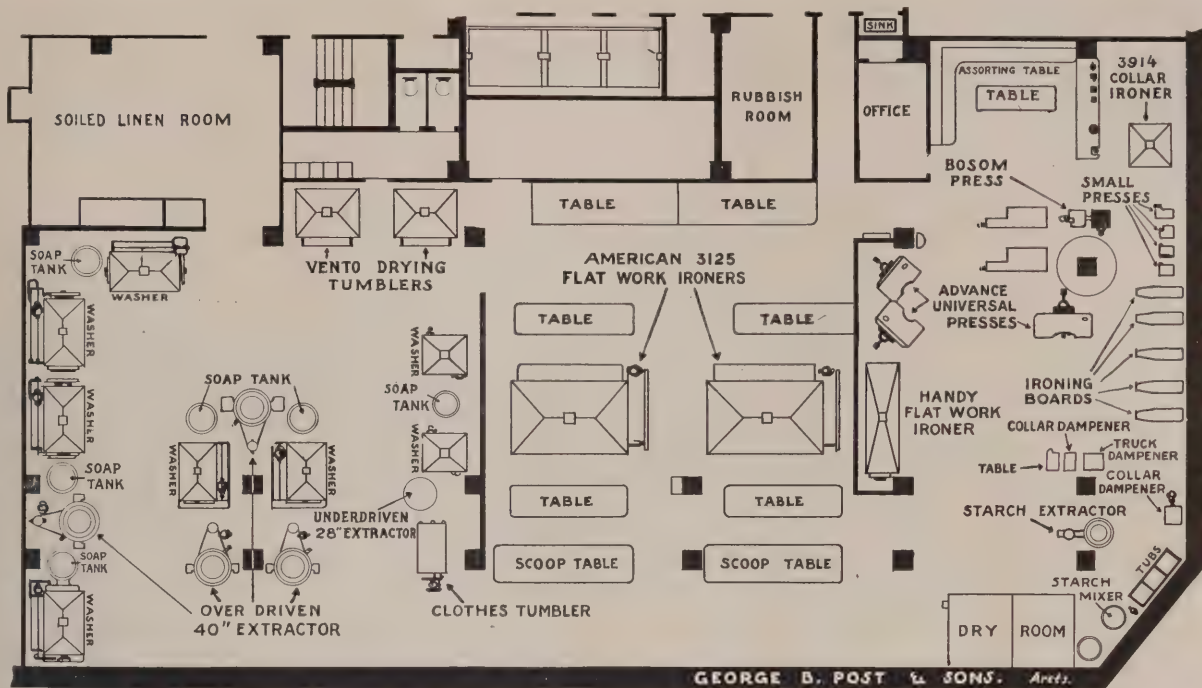
*Send for bulletin containing complete information about various models  
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## The New Statler — St. Louis is all American Equipped

Keen judgment of laundry machinery for hotel uses, developed by years of experience and experiment, led the Statler organization to install American equipment exclusively in its new St. Louis Hotel as it had previously in all the other Statler Hotels.

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"TRUSS-LOOP" placed on  $\frac{3}{4}$ " Chan-  
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centers, furnished rigid construction  
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**The Bostwick Steel Lath Co.**  
Niles, Ohio



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Bulletins describing our complete line of Horizontal, single-stage, single suction and double suction, Multi-stage, Vertical and Fire Pumps mailed on request. *Write our nearest office.*

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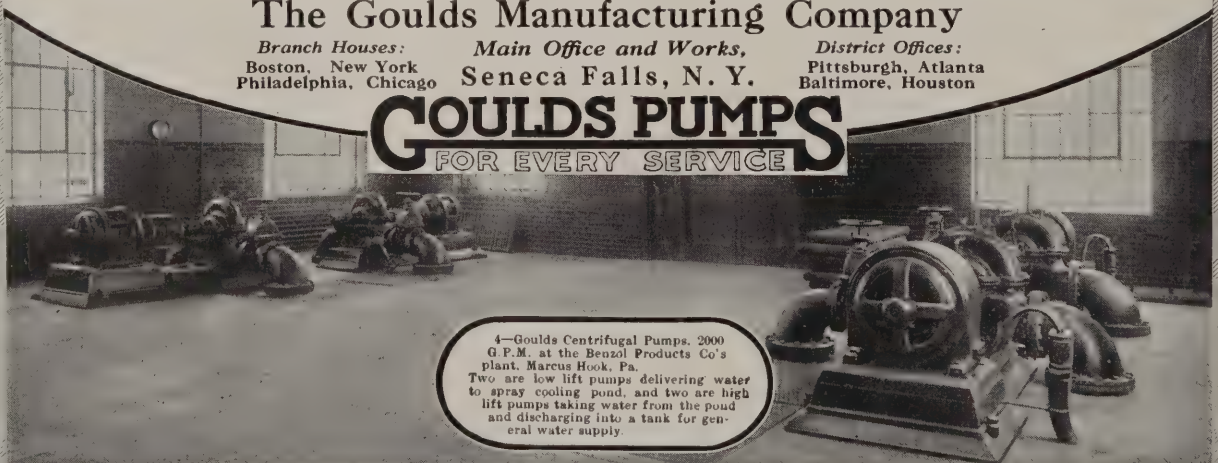
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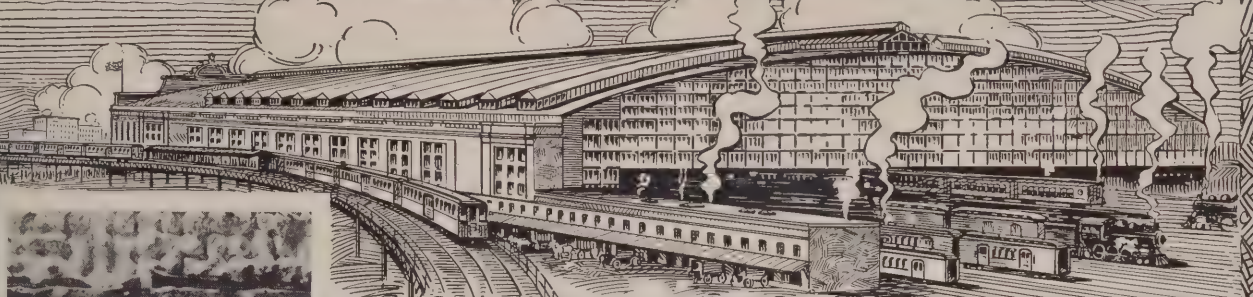
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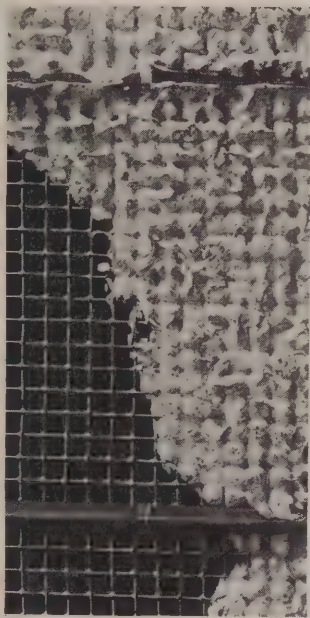
4—Goulds Centrifugal Pumps, 2000  
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Two are low lift pumps delivering water  
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The plastered walls have a supporting base of Wright Wire Lath.

This is but one of thousands of buildings in which Wright Wire Lath has been in use for the past quarter century and more. Its superiority has been demonstrated in building — from the modest house to the most palatial dwelling — in buildings designed and used for all purposes.

Where durability, permanency, fire-retarding properties are the chief feature to be considered, specify Wright Wire Lath.

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St. Regis Apartments, St. Louis, Mo.  
Architect, Geo. H. Kennerly



THE Land of History and Romance. The Land of the Mule and the "Houn' Dawg." The land of great cities, rich mines and vast stretches of fertile, well-tilled farm land dotted with comfortable homes.

Missouri brings to mind Father Marquette, La Salle, old days of Spanish and French grandeur, Rose of Old St. Louis, Louisiana Purchase, Missouri Compromise: The Crisis, Huck Finn and Tom Sawyer, St. Louis Exposition, Steamboat Bill, Dan Matthews, "Show Me" and the Idea of a great rich Progressive State, standing high among her Sister States in Patriotism, Productiveness, Education and Civic development.

Missouri has used

## Berger's Metal Lumber

extensively for her Hospitals and Schools, for her Hotels, Apartment Houses, Business Blocks and Homes.

We show here a few Missouri buildings of which Berger Metal Lumber forms the inner structure. We mention a few of the others.

Do *you* use Berger Metal Lumber? Do you *know* about it? If not, write us on your letterhead or on a post card and mail it to Dept. L. F. at your nearest Berger Branch, also see Sweet's, pages 244-250.



## The Berger Mfg. Co., Canton, Ohio

Branches: Boston New York Philadelphia Chicago St. Louis Minneapolis San Francisco  
Export Dept.: Berger Bldg., New York City, U. S. A.

### A Few Other Missouri Installations of Berger's Metal Lumber

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Bloomfield Bank, Bloomfield, Mo.  
Dudfield Building and Bank, Liberty, Mo.  
South Side School, Mexico, Mo.  
Bailey Apartments, Kansas City, Mo.

Gymnasium, Mexico, Mo.  
State Industrial School, Tipton, Mo.  
Klein Bldg., Kansas City, Mo.  
Hoffman Bros. Bldg., Kansas City, Mo.  
Farmers' Trust and Bank Bldg., Maryville, Mo.

Kling & Allen Bldg., Kansas City, Mo.  
G. H. Nettleton Residence, Kansas City, Mo.  
Washington Hotel, Kansas City, Mo.  
Jameson Garage, Fulton, Mo.



Clay County Infirmary, New Liberty, Mo.  
Architects, F. E. Parker & Sons



Parochial School, Kansas City, Mo.  
Architects, Miller, Opal & Corbett

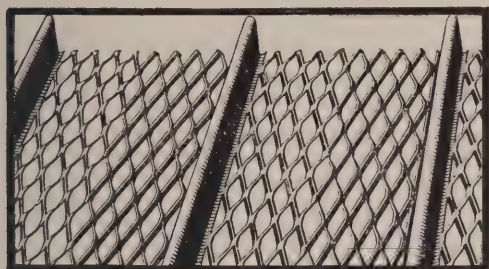


Regent Hotel, St. Louis, Mo., Showing Berger's Metal Lumber Installed

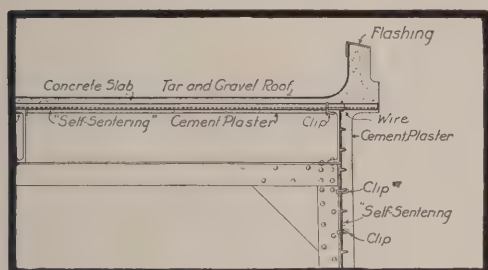
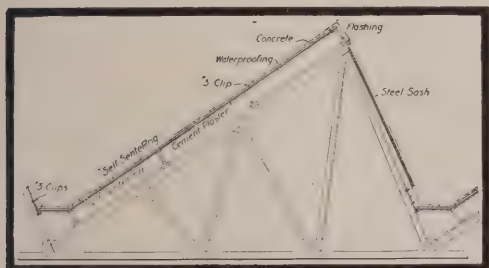


# How to save money on concrete construction — specify SELF-SENTERING

Self-Sentering saves money because it saves material—saves weight—saves time and labor—saves maintenance costs.



SELF-SENTERING

DETAIL OF EAVES OF FLAT  
SELF-SENTERING ROOFDETAIL OF SELF-SENTERING  
SAW-TOOTH ROOF

SELF-SENTERING ROOF

Study the diagrams on this page. The first one shows a section of Self-Sentering. Note the strength and rigidity of the material—the parallel series of heavy, cold-drawn ribs, connected by diamond mesh, the most efficient form of expanded metal. Self-Sentering is a combined centering and reinforcing for concrete roof and floor construction. It acts first as form for the wet concrete, and as permanent reinforcing after the concrete is poured. It eliminates the need of temporary wooden forms.

## Self-Sentering

Form and Reinforcement for Concrete Construction

Study with special care the two diagrams that show details of Self-Sentering roof construction. Self-Sentering roofs are adapted equally to steel-frame, wood-frame, or concrete-frame buildings. These sheets are merely laid over the roof supports, attached to them securely by clips, wire nails, or staples, and the concrete applied to the required thickness. Only enough passes through the mesh to imbed the steel thoroughly. The under side is then plastered with cement mortar and the roof completed.

The details of Self-Sentering floor construction are illustrated at the bottom of the page.

As in the case of Self-Sentering roofs, floors made of this material are comparatively light in weight, amply strong, fire-resistive, economical to build and maintain, permanent.

Present conditions imperatively demand that the architect or engineer should co-operate closely with his clients in the way of money-saving, enduring construction. That is why Self-Sentering is so logical and so desirable. *Write for complete data.*

### THE GENERAL FIREPROOFING COMPANY, Youngstown, Ohio

Manufacturers of all types of Metal Lath, Concrete Reinforcements, and Waterproofings

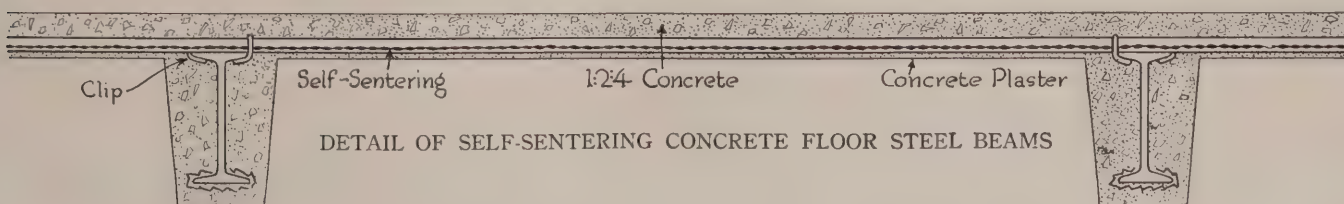
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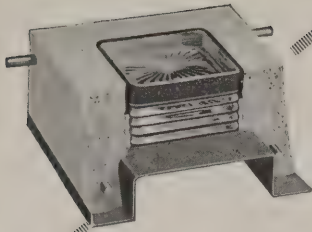
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DETAIL OF SELF-SENTERING CONCRETE FLOOR STEEL BEAMS



## Time Saving Construction

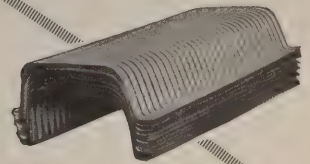
**BERGER'S**  
*Raydiant*

### Sidewalk Light System

The interlocking steel forms, reinforcing rods and lenses can be easily and quickly put in place. Centering is unnecessary and saving in time, labor and materials is the result.

Note how the lens is supported by the form and how it is cushioned against the expansion of the concrete.

The clear, tough Lazalite glass used for all Berger lenses; the easy replace feature if breakage through accident should occur; and the greater strength of the Raydiant System are all advantages you should consider. Have you our new Catalog T. F.?



### Berger's Pressed Steel

### Cores for Concrete Floors

These Cores can be used to splendid advantage for long span fireproof construction. They are easily and quickly put into place, and much of the centering is eliminated. The lighter weight permits a considerable saving in girders, columns and footings.

Berger's Steel Cores have been used to splendid advantage in all types of buildings. We'll be glad to refer you to architects and contractors in your territory, who are successfully using this method of floor construction.

*See Sweet's, page 195, and write Dept. N. T.  
for full information*

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CANTON

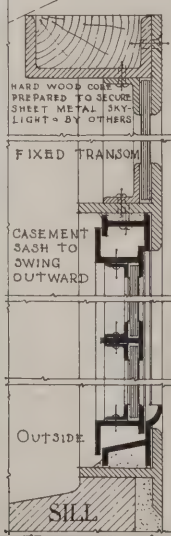
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PREPARED TO SECURE  
SHEET METAL SKY-  
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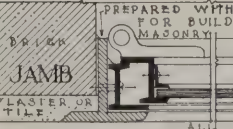
FIXED TRANSOM

CASEMENT  
SASH TO  
SWING  
OUTWARD

OUTSIDE

SILL

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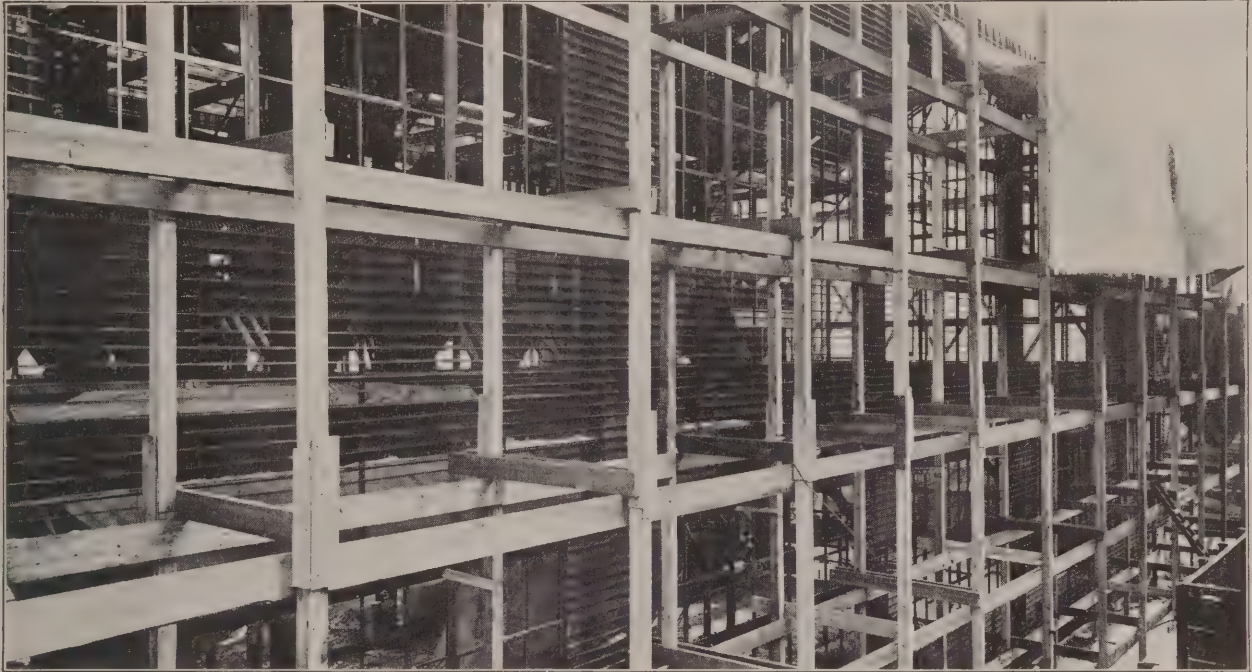
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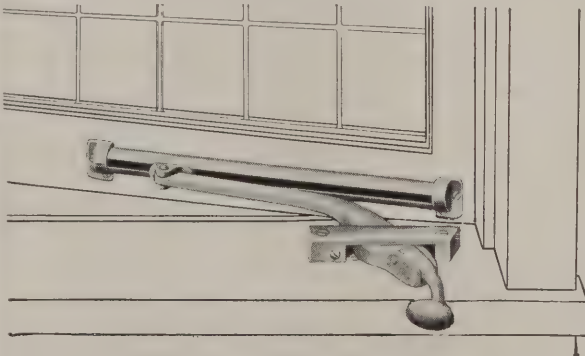
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For more complete information see Sweet's Catalogue. Samples and models may be seen at Building Material Exhibit, Insurance Exchange, Chicago, and Architects Samples Co., Architects' Building, New York.



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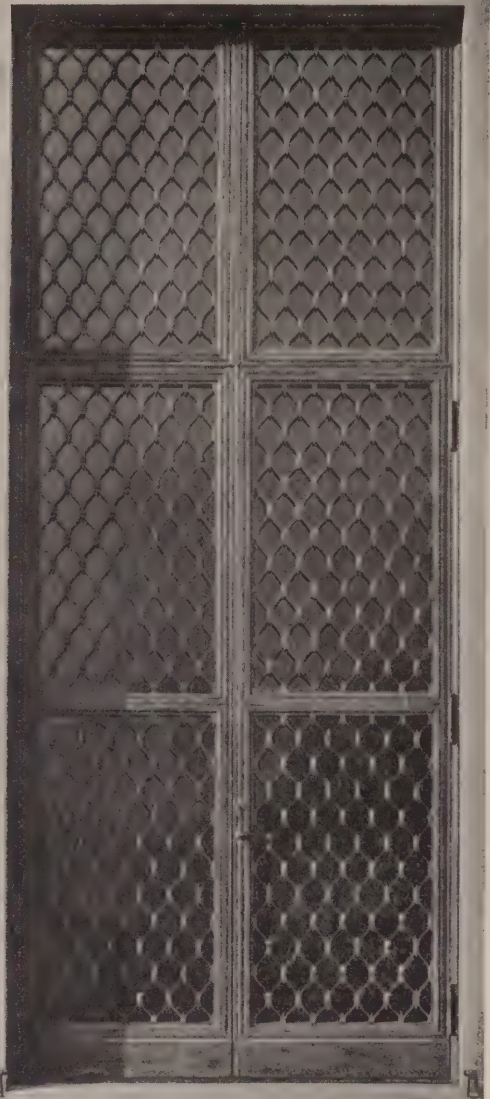
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**Durability** means freedom from glass breakage and corrosion. The glass in Lupton Rolled Steel Skylight does not touch metal at any point, neither is it puttied. Instead, it is held between resilient strands of specially saturated oakum, which allow expansion and contraction to take place unhindered. Corrosion is minimized by making all parts exposed to weather of copper or brass.

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It is fully described in our No. 9 catalogue. Have you a copy?



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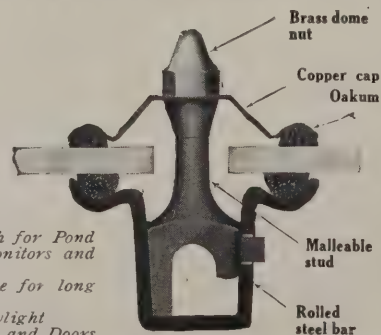
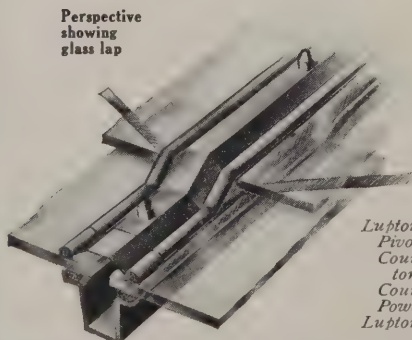
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- Once up—always ready.
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- Cost compares favorably with other standard screens—some-what less than that of certain types.

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Consists of a spring roller with rust-proof screening attached. Metal channel on each side of casement guides screens for raising or lowering. These hold the screen tightly and prevent the possibility of loosening or buckling.

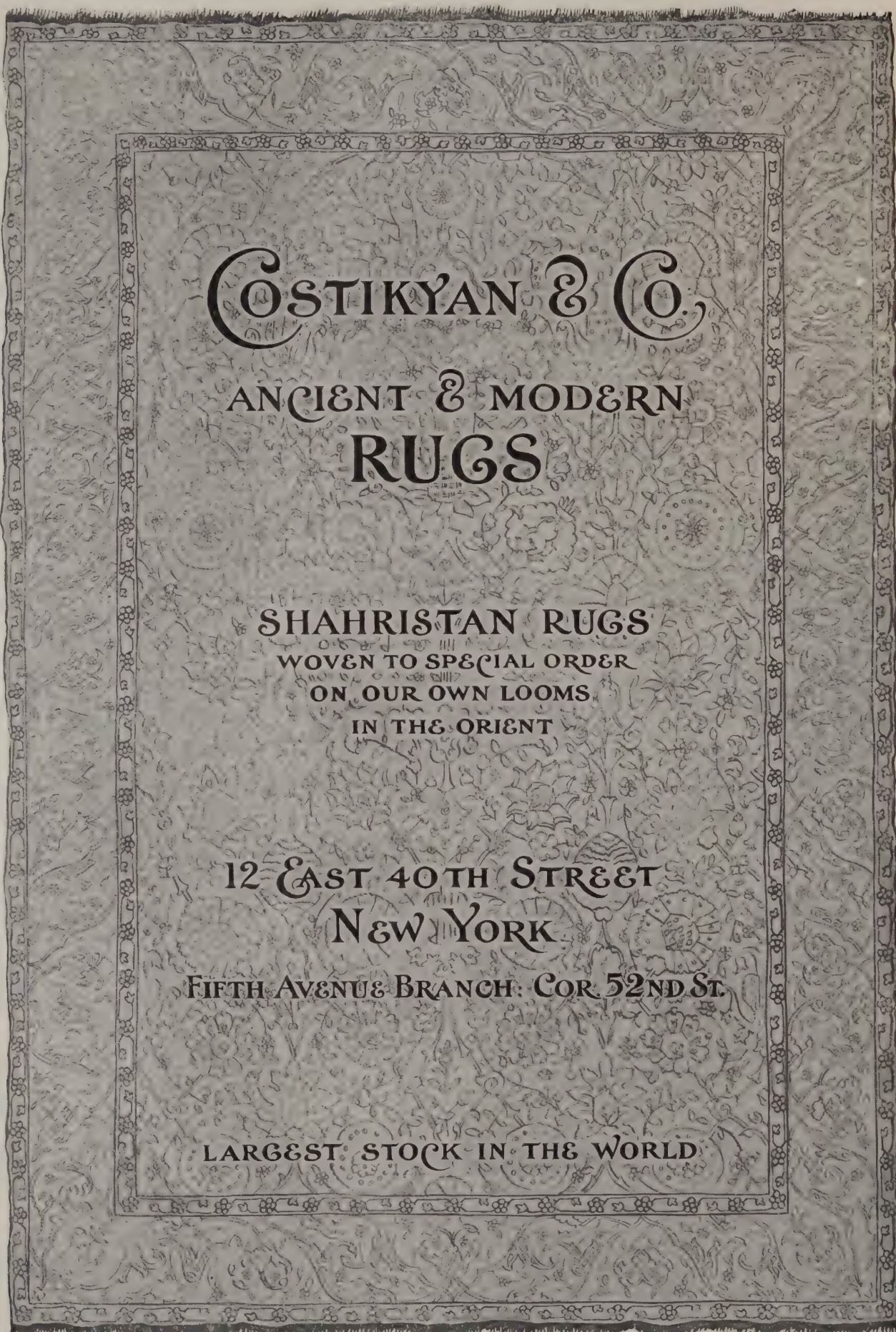
Both roll and screen are well protected from rain, dust and the elements. Thus protected, it rests during winter months and is immediately ready for use when screen protection is demanded. Installation in no way interferes with blinds or sash.

*The entire device is thoroughly rust-proofed  
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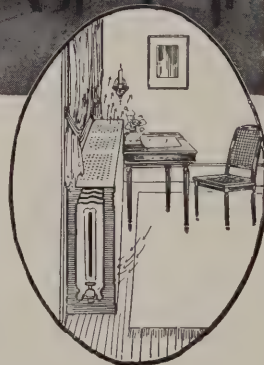
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(Trade-Mark)

THE IDEAL FLOOR

Nonpareil Cork Tiling is made solely of clean cork shavings, compressed in molds and baked. The baking process liquefies the natural rosin of the cork (a tenacious, waterproof gum), which binds the particles into a compact mass. No binder is added. The tile are pure cork, quiet and resilient under foot, beautiful in appearance and possess a truly remarkable durability. And it is because of these qualities that Nonpareil Cork Tiling has found favor in hospitals such as the following:

St. John's Hospital, Anderson, Ind.  
Boston City Hospital, Boston, Mass.  
Cleveland Jewish Hospital, Cleveland, O.  
Ford Hospital, Detroit, Mich.  
Maurice Sanitarium, Hot Springs, Ark.  
Ohio State Hospital, Lima, O.  
Sisters Hospital, Lima, O.

Bellevue Hospital, New York City  
Flower Hospital, New York City  
Gouverneur Hospital, New York City  
Manhattan State Hospital, New York City  
New York Post Graduate Hospital, New York City  
Mayo Clinic, Rochester, Minn.  
Mercy Hospital, Toledo, O.

The *Book of Designs* shows how Nonpareil Cork Tiling can be made into artistic floors that will meet practically all architectural requirements

A copy of the book and samples of Nonpareil Cork Tiling will be sent, free of charge, on request

DAVID E. KENNEDY, INC., 55 Fifth Avenue, New York City

1524 Chestnut Street, Philadelphia, Pa.  
176 Federal Street, Boston, Mass.  
Rand-McNally Building, Chicago, Ill.

Branches at

304 University Street, Montreal, Que.  
Sharon Building, San Francisco, Cal.  
518 Colorado Building, Washington, D. C.

Distributors for Armstrong Cork Company

# REGENT

## SHADES BOWLS GLOBES



### "Regent" Dares to be Different

YOU can get Regent Glassware of standard designs. But the Regent reputation is being built on daringly original patterns such as the one shown here. This is a "Rozelle" decoration in pastel colors on softly tinted "Ivre" glass. In the best of taste, it harmonizes with the current demand for a bit more *color* in interior decoration. It matches the better-grade modern things in draperies, rugs and wall coverings. May we send you a catalog and tell you where to see the Regent line? Ivanhoe-Regent Works, of General Electric Co., Cleveland, Ohio.

*For all Canadian business refer to Canadian General Electric Co., Limited, Toronto, Ont.*





# BRASCOLITE

TRADE MARK REGISTERED



## *The Light For Every Purpose*

Brascolite's variety of designs include special adaptations for schools, libraries, churches, railway stations, State Capitols, public, industrial and private edifices of many descriptions. A wide range of period de-

signs to harmonize with architectural styles.

A soft, clear, serviceable light, it embodies the principles of reflection and diffusion as no other light does in the same degree.

### LUMINOUS UNIT COMPANY, St. Louis, U. S. A.

New York  
30 Church Street

Chicago  
19 South Fifth Avenue  
Philadelphia, 1007 Land Title Building

Boston  
Old South Building

San Francisco  
132 Lick Building

Canadian Distributors: Northern Electric Co., Ltd.





**The Sun Never Sets  
on the Santa Fe  
Building**

because at night the glow of the  
Mazdas takes on a sunlike quality  
through the agency of

# Jefferson

**DORIC  
MOONSTONE  
GLASSWARE**

with which the building is equipped  
The illustration above shows the  
type of fixture installed

The Santa Fe building was de-  
signed by Architects Wood and  
Simpson of San Francisco and cost  
\$300,000 to erect

The War Department of the West-  
ern Division of the U. S. A. occu-  
pies the fifth to twelfth floors  
inclusive

**The Jefferson Glass Co.**  
Follansbee, West Virginia  
New York Chicago  
Baltimore San Francisco



Have you had a copy of our new artistic  
Doric booklet? If not write for one



## SMYSER-ROYER CO.

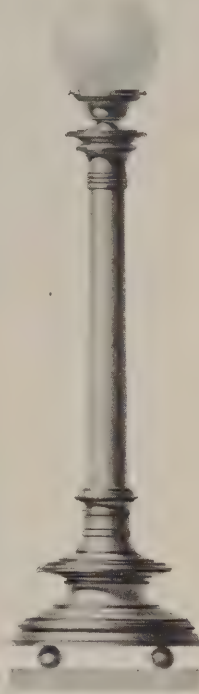
Architectural  
and Ornamental  
Iron and Bronze  
Work

EXTERIOR LIGHTING  
FIXTURES A SPECIALTY

A special knowledge of  
the subject of exterior  
lighting, combined with  
years of successful orna-  
mental metal work pro-  
duction, enable us to in-  
corporate into our stand-  
ards every refinement  
of artistic and utilitarian  
value.

More than 350 models  
listed in our several cata-  
logues.

*Write for Descriptive  
Literature and kindly  
mention this publication*



Design No. 328

WORKS: YORK, PA.

PHILA. OFFICE & STUDIO: 1225 RACE ST.

**Desco**  
METAL  
STORE FRONTS

## Make Dull Months Productive

When building slows up, when new con-  
struction is postponed or abandoned, it does  
not necessarily mean that your business  
must be curtailed.

Desco Store Front construction, if properly  
pushed, will fill the gap profitably. For  
many stores in your city, forced to abandon  
their building plans, will remodel to increase  
the attractiveness of their present quarters.

Desco construction is adaptable to any style  
of building and combines beauty with sturdi-  
ness. It is free from complication in design  
and in installation. It opens the way for  
profitable and satisfactory business for you.

Write us for details *to-day*.

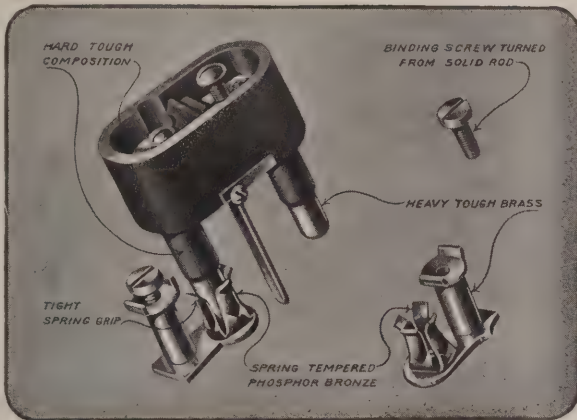
**DETROIT SHOW CASE COMPANY**

467 Fort Street, West Detroit, Mich.





# SWITCHES



## Little Things of Big Value

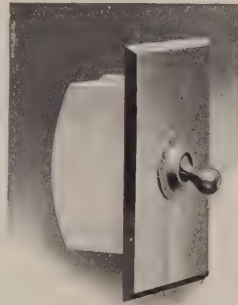
Here you see the kind of connections a "Diamond H" Receptacle affords—tight, solid, everlasting. The connectors themselves are of heavy, tough brass. The contacts are of spring-tempered phosphor-bronze—notice how they grip the plug terminals under spring tension that never lets go. The binding screws are turned from a solid rod—not upset from wire stock, leaving a weak head that a screw-driver can break off. The insulation is of hard, tough, indestructible composition. Do you believe in thoroughness in little things?

THE HART  
MANUFACTURING COMPANY  
HARTFORD, CONN.

# RECEPTACLES

Introducing the

## Western Electric Toggle Switch



**T**HE Western Electric Toggle Switch is the latest and most revolutionary improvement in switch design. Its invention and introduction

mark a new era. It combines convenience and neatness with a positive long-wearing mechanism.

**Convenience.**—The small neat lever, unobtrusively presenting itself through the small neat plate is the logical means of turning lights on or off. A flip up of the lever, lights, a flip down, extinguishes, both actions the most natural and logical and both the quickest in emergency.

There is no fumbling for the right button or twisting off the switch key, the lever is large enough to be found readily, yet small enough not to protrude unnecessarily.



Let our nearest house explain all  
the advantages of this switch  
or ask for Circular S2102

## Western Electric Company

INCORPORATED

|              |             |              |               |                |
|--------------|-------------|--------------|---------------|----------------|
| New York     | Atlanta     | Chicago      | St. Louis     | San Francisco  |
| Buffalo      | Savannah    | Cleveland    | Cincinnati    | Oakland        |
| Newark       | Birmingham  | Indianapolis | Kansas City   | Los Angeles    |
| Boston       | New Orleans | Detroit      | Omaha         | Seattle        |
| New Haven    | Charlotte   | Milwaukee    | Oklahoma City | Portland       |
| Philadelphia | Baltimore   | Minneapolis  | Dallas        | Salt Lake City |
| Pittsburgh   | Richmond    | St. Paul     | Houston       | Denver         |

EQUIPMENT FOR EVERY ELECTRICAL NEED  
Member Society for Electrical Development. "Do it Electrically"



## The master of the door

The Yale Door Closer makes any door fulfil perfectly its principal functions—*remain closed*. It controls that door absolutely—eliminating slamming—closing it quietly and always. And beyond that, where it is necessary that a door be kept *open* temporarily—the Yale Door Closer embodies a simple efficient device to do *that*, when so ordered.

Yale Door Closer is the master of the door—the perfect door closing device.

The Yale & Towne Mfg. Co., 9 East 40th Street, New York  
Chicago Paris London  
Canadian Yale & Towne Limited, St. Catharines, Ont.

## "STAR" VENTILATORS



### U. S. Army Hospital, Jefferson Barracks, Mo.

Fifteen "STAR" Ventilators are helping to keep the atmosphere of this Army Hospital clean and wholesome for convalescent soldiers.

"STAR" Ventilators are the first choice of those who know the value of good ventilation, as has been proven by their installation on many recent buildings erected by the U. S. Government and numerous large industrial plants throughout the country.

SEND FOR OUR DESCRIPTIVE BOOKLET

Manufacturers of

Evans' "ALMETL" Fire Doors  
"Merchant's Old Method" Roofing Tin

## MERCHANT & EVANS Co

NEW YORK PHILADELPHIA WHEELING  
BALTIMORE ATLANTA CHICAGO  
CLEVELAND KANSAS CITY

## Columbian Sash & Pulleys

December **T**HIS is a bad time of year to be held up in getting your windows hung.

Columbian Sash-Pulleys are

In Stock Ready to Ship



*Standard in Size,  
in Quality, in Satisfactory Service*

## The Columbian Hardware Company

Manufacturers Cleveland, O., U. S. A.



## "Standard"

### "Pembroke" Built-in Baths

fully meet the modern demand for a combination of *beauty* and *service*. They are worthy representatives of the great "Standard" line of fixtures for Bath, Kitchen, Laundry, etc.

Architects are requested to use the service of our representatives in all principal cities, and to accept the advantages offered in our many showrooms.

### Standard Sanitary Mfg. Co.

Dept. 4

Pittsburgh





# KOHLER WARE

*always of one quality—the highest—*  
**means a pleasing bathroom**

A bathroom containing the original, *one-piece* built-in bath, the "Viceroy" produced by KOHLER OF KOHLER, is sure to be a permanent source of delight to your clients.

This bath, illustrated below, with its *one-piece* construction, graceful lines and KOHLER pure white enamel, has become America's foremost built-in bath. And leading architects are specifying it for buildings of all classes that require the best in plumbing ware.

The KOHLER line includes lavatories and sinks of the same distinctiveness.

The name KOHLER, in faint blue in the enamel, is our pledge that each piece of KOHLER WARE represents first quality.

Write for our new book, "KOHLER OF KOHLER."

**KOHLER CO.,** Founded 1873 **Kohler, Wis.**

Boston New York Philadelphia Pittsburgh Detroit  
 Chicago Indianapolis St. Paul St. Louis Houston  
 San Francisco Los Angeles Seattle London



# THE EXHIBIT ROOMS OF CRANE CO.

The Opening of the New York City Exhibit Rooms  
of CRANE CO.,

23 West Forty-fourth Street  
22 West Forty-fifth Street

Is the High Mark in the Steady Development of one  
Feature of the Company's Branch House Service.

The Exhibit Rooms of Crane Co. serve the people  
in the Leading Cities of the United States and Canada  
named below. They are centers where all interested  
in Building may find what is needed for the Power,  
Plumbing, Heating, Ventilating, Vacuum-cleaning,  
Refrigerating, Water, Gas, and other Piping  
Requirements.

Through the Plumbing and Heating Trade Crane  
Co. thus offers the Distinct Advantage of Dealing  
with one Responsible and Adequate House.

Visitors to any Crane Exhibit Room will be  
Cordially Welcomed.

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| New York     | Savannah    | St. Louis     | Des Moines   | Great Falls | Oakland        |
| Brooklyn     | Atlanta     | Kansas City   | Omaha        | Spokane     | San Francisco  |
| Philadelphia | Knoxville   | Terre Haute   | Sioux City   | Seattle     | Los Angeles    |
| Newark       | Birmingham  | Cincinnati    | St. Paul     | Tacoma      | Winnipeg       |
| Camden       | Memphis     | Indianapolis  | Minneapolis  | Portland    | Vancouver      |
| Baltimore    | Little Rock | Detroit       | Duluth       | Pocatello   |                |

*Works: Chicago and Bridgeport*

1855—**CRANE CO.**—1917

VALVES AND FITTINGS



# BYERS

## Who was the Architect?

Who was the architect of the Dakota Apartments, New York City, erected 1882? Whether living or dead, we would like to find out who he was. Can anybody tell us?

## BYERS GENUINE WROUGHT IRON PIPE FULL WEIGHT GUARANTEED

was installed in the heating system of these apartments, perhaps the largest and finest of their day. The excellent condition of the entire piping system, after 35 years' service, says more for the durability of genuine wrought iron than volumes of scientific discussions on corrosion problems.

Send for our booklet, "On the Trail of

Byers Pipe." It tells about dozens of other famous old buildings — not one of them less than 25 years old — all Byers equipped.

Has cheaper pipe any such record?

**A. M. BYERS COMPANY**

Established 1864

**PITTSBURGH, PA.**

NEW YORK      BOSTON      CHICAGO  
HOUSTON      LOS ANGELES



**Dakota Apartments, New York City,  
Erected 1882**

With the Murray Hill Hotel, the Cooper Union, the Presbyterian Hospital and other noble old structures, the Dakota Apartments is but one of the many landmarks of New York City in which Byers pipe speaks a language all its own about pipe durability.





Write to any of the following Independent and Competing Makers of

# CAST IRON SOIL PIPE AND FITTINGS

*for a copy of this Book*

ONE HUNDRED DOLLARS  
AWARDED FOR PHOTOGRAPHS IN THE  
INTEREST OF SANITARY HOUSE DRAINAGE

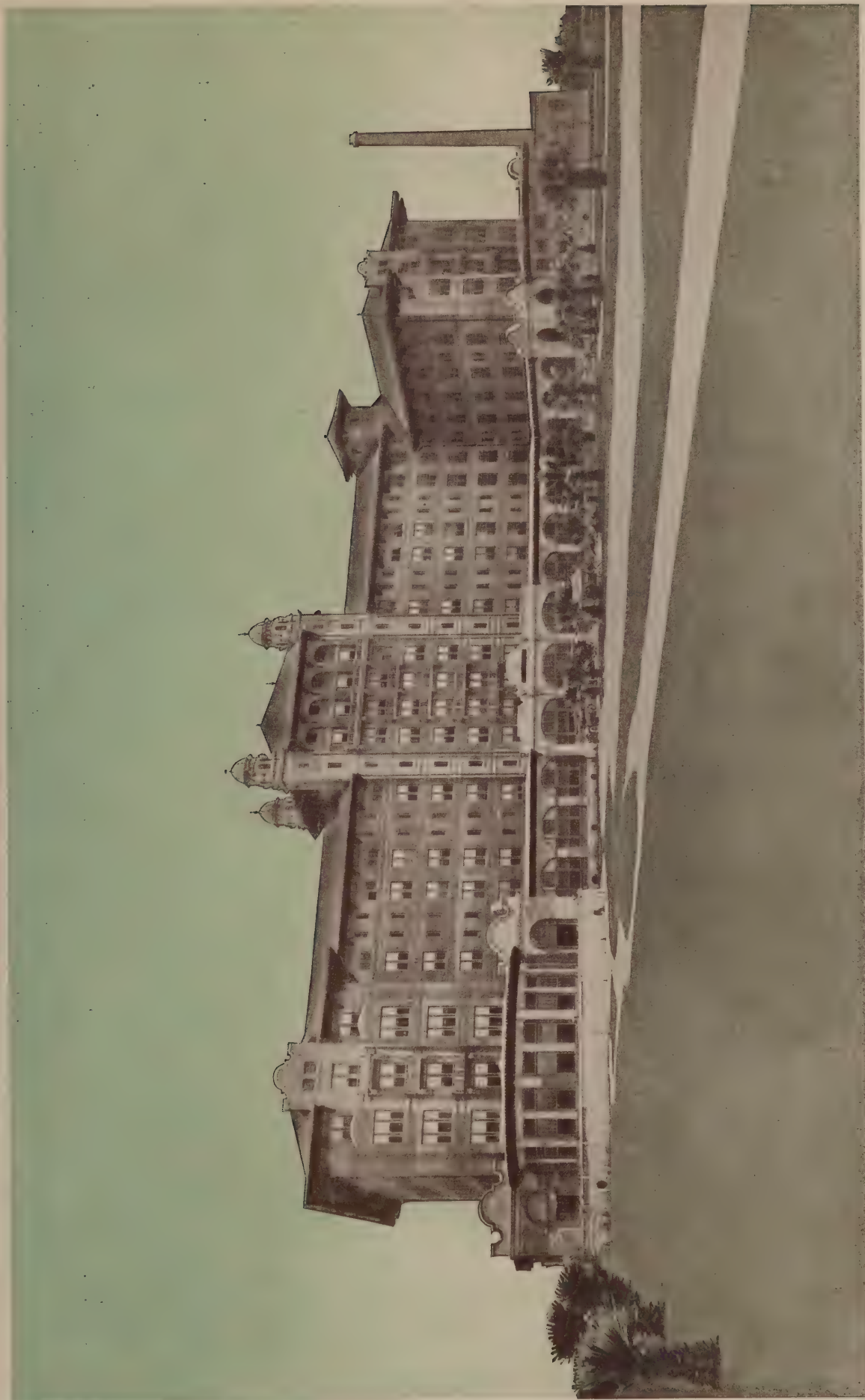
## A NATION-WIDE COMPARISON OF HOUSE DRAINAGE PIPING

IN THE  
BUILDING  
UNDER THE  
GROUND

|                                     |                     |
|-------------------------------------|---------------------|
| Salem Brass & Iron Mfg. Co.         | Salem, N. J.        |
| Sanitary Co. of America             | Linfield, Pa.       |
| Somerville Iron Works               | New York, N. Y.     |
| Standard Foundry Co.                | Annlston, Ala.      |
| Superior Mfg. Co.                   | Bessemer, Ala.      |
| Union Foundry Co.                   | Annlston, Ala.      |
| Welskittel & Son Co., A.            | Baltimore, Md.      |
| Wetter Mfg. Co., H.                 | Memphis, Tenn.      |
| Abendroth Brothers                  | Port Chester, N. Y. |
| Alabama Pipe & Foundry Co.          | Annlston, Ala.      |
| American Foundry & Pipe Co.         | Penns Sta., Pa.     |
| Annlston Foundry Co.                | Annlston, Ala.      |
| Bessemer Soil Pipe Co.              | Bessemer, Ala.      |
| Campbell Mfg. Co.                   | Oadaden, Ala.       |
| Cesey-Hedges Co., The               | Chattanooga, Tenn.  |
| Central Foundry Co.                 | New York, N. Y.     |
| Charlotte Pipe & Foundry Co.        | Charlotte, N. C.    |
| Cosas Pipe & Foundry Co.            | Birmingham, Ala.    |
| Crown Pipe & Foundry Co.            | Jackson, Ohio       |
| Oadaden Pipe Co.                    | Oadaden, Ala.       |
| Haines, Jones & Cadbury Co.         | Philadelphia, Pa.   |
| Johnson Co., J. D.                  | New York, N. Y.     |
| Krupp Foundry Co.                   | Lansdale, Pa.       |
| Medina Foundry Co.                  | Medina, N. Y.       |
| National Foundry Co. of N. Y., Inc. | Brooklyn, N. Y.     |
| National Pipe & Foundry Co.         | Attalla, Ala.       |
| Reading Foundry & Supply Co.        | Reading, Pa.        |

USE SOIL PIPE WHERE SOIL PIPE SHOULD  
BE USED





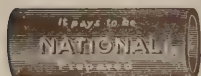
Architects—Mauran & Russell, St. Louis, Mo.

## HOTEL GALVEZ GALVESTON, TEXAS

Contractors—James Stewart & Company, New York

Another "NATIONAL" sized Building—(See following page)

# "NATIONAL" Pipe in Large Buildings



## HOTEL GALVEZ GALVESTON, TEXAS



☐ The architectural development of the "resort" hotel seems little short of marvelous, when memory pictures the sternly utilitarian, square buildings (more frequently frame than brick) that were the usual type previous to the '70's or thereabouts. These just happened; for, as business increased, box-like sections were added onto the original box-like structure.

☐ Certainly these were innocent of architectural design!

☐ It is different today. The Hotel Galvez, in Galveston, Texas, is (so to speak) an antipodal companion to The Traymore, in Atlantic City, N. J. (see pages 39-40 of June issue of this series), and shows, incidentally, the use of "NATIONAL" Pipe in modern hotels from coast to coast.

☐ This magnificent and imposing structure is one of the distinctive resort hotels in America. It cost a million dollars and is modern in every detail. That "NATIONAL" Pipe—the modern pipe—was specified and installed follows as a matter of course.

☐ Architects who design the modest buildings costing a few thousand dollars, and those whose designs reach the million dollar mark to construct, alike specify "NATIONAL" Pipe as the most suitable for their purpose, for "NATIONAL" Pipe has proved durable (and therefore satisfactory) in all types of buildings.

Complete information about "NATIONAL" Pipe may be found on pages 1339-1351, inclusive, of the 1917 edition of Sweet's Catalogue. This is the tenth of a series of "NATIONAL"ized buildings as follows:

THE UNION ARCADE, Pittsburgh, Pa.  
American Architect, Feb. 21st, pages 60-61.  
Architectural Forum, March, pages 41-42.  
Buildings & Building Management, May, pages 23-24.

THE EQUITABLE BUILDING, New York, N. Y.  
American Architect, March 21st, pages 19-20.  
Architectural Forum, April 1st, pages 35-36.

CONTINENTAL & COMMERCIAL NATIONAL BANK BUILDING,  
Chicago, Ill.  
American Architect, May 2nd, pages 21-22.  
Architectural Forum, May, pages 45-46.  
Buildings & Building Management, June, pages 23-24.

HOTEL TRAYMORE, Atlantic City, N. J.  
Architectural Forum, June, pages 39-40.  
Buildings & Building Management, July, pages 23-24.

JOHN WANAMAKER COMPANY BUILDING, Philadelphia, Pa.  
Architectural Forum, July, pages 33-34.

Buildings & Building Management, August, pages 23-24.

DODGE BROTHERS MOTOR CAR COMPANY MANUFACTURING  
PLANT, Detroit, Mich.

Architectural Forum, August, pages 37-38.

Buildings & Building Management, September, pages 23-24.

MORMON TEMPLE, Salt Lake City, Utah.

Architectural Forum, September, pages 71-72.

Buildings & Building Management, October, pages 23-24.

SCHENLEY HIGH SCHOOL, Pittsburgh, Pa.

Architectural Forum, October, pages 71-72.

Buildings & Building Management, November, pages 23-24.

MICHIGAN CENTRAL R. R. STATION, Detroit, Michigan.

Architectural Forum, November, pages 71-72.

Buildings & Building Management, December, pages 23-24.

☐ To readily identify "NATIONAL" material and as protection to manufacturer and consumer alike, the practice of National Tube Company is to roll in raised letters of good size on each few feet of every length of welded pipe, the name "NATIONAL" (except on the smaller butt-weld sizes, on which this is not mechanically feasible on these smaller butt-weld sizes the name "NATIONAL" appears on the metal tag attached to each bundle of pipe).

☐ When writing specifications or ordering tubular goods, al-

LOOK FOR THE MARK

Name Rolled in Raised Letters on National Tube Company Pipe

ways specify "NATIONAL" pipe, and identify as indicated.

☐ In addition, all sizes of "NATIONAL" welded pipe four in. and under are subjected to a roll-knobbing process known as Spellerizing to lessen the tendency to corrosion, especially in the form of pitting. This Spellerizing process is peculiar to "NATIONAL" pipe, to which process National Tube Company has exclusive rights.

☐ "NATIONAL" pipe was awarded the GRAND PRIZE (highest possible award) at Panama Pacific International Exposition, 1915.

## NATIONAL TUBE COMPANY

General Sales Offices, Frick Building, Pittsburgh, Pa.

### DISTRICT SALES OFFICES

|                                                                                                        |            |           |          |                |          |
|--------------------------------------------------------------------------------------------------------|------------|-----------|----------|----------------|----------|
| Atlanta                                                                                                | Boston     | Chicago   | Denver   | New Orleans    | New York |
| Philadelphia                                                                                           | Pittsburgh | St. Louis | St. Paul | Salt Lake City |          |
| Pacific Coast Representatives: U. S. Steel Products Co., San Francisco, Los Angeles, Portland, Seattle |            |           |          |                |          |
| Export Representatives: U. S. Steel Products Co., New York City                                        |            |           |          |                |          |

(See preceding page for illustration)



## Bay State Agatex

Block the attacks of water, grease, scuffing shoes and heavy furniture on your cement floors with Bay State Agatex.

Cement is porous. The first drop of grease spells ruin to the even, good looks of your floor. No amount of scrubbing will rejuvenate it. Water is absorbed and the resulting dampness is unhealthful. Constant friction creates dust, cracks and pits. And *think*—a little precaution—a covering of Agatex will keep your floor *new*.

Two coats of Bay State Agatex cover your floor. It sinks in and binds every little particle of cement.

It makes the floor wear-proof, waterproof, oilproof, dustproof and every-other-kind-of-proof.

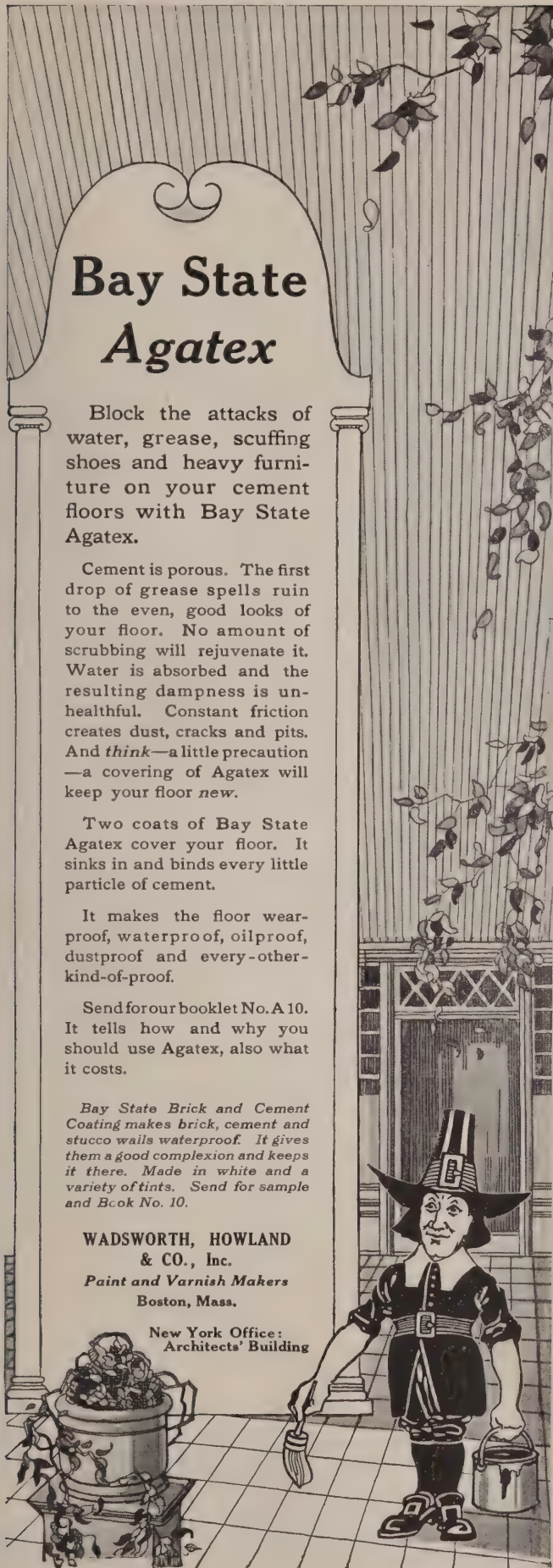
Send for our booklet No. A 10. It tells how and why you should use Agatex, also what it costs.

*Bay State Brick and Cement Coating makes brick, cement and stucco walls waterproof. It gives them a good complexion and keeps it there. Made in white and a variety of tints. Send for sample and Book No. 10.*

**WADSWORTH, HOWLAND  
& CO., Inc.**

*Paint and Varnish Makers*  
Boston, Mass.

New York Office:  
Architects' Building



THE DIGNITY OF AN OCCASION

is always preserved when

**The Trenton Potteries Co.**

**SILENT Si-wel-clo CLOSET**

is installed in the home.

The Si-wel-clo operates so quietly that it cannot be heard outside the bathroom. Built of china, modeled on the best syphon jet principles, glazed and vitrified so that soil will not adhere to its surface. A damp cloth removes all traces of dirt.

No effort has been spared to make the Silent Si-wel-clo the finest closet outfit on the market. Seat and lid extra strong and highly finished, of Birch Mahogany or White Celluloid, with no exposed metal parts to become tarnished. Tank fittings that will give maximum service with low maintenance expense.

The Si-wel-clo is but one unit in an entire line of all-clay plumbing fixtures from bathtubs to urinal stalls. It is a demonstration of what you can expect from our complete line. A trial in your next specification will make you a Tepeco convert.

Write for Catalogue N

**The Trenton Potteries Co.**

Trenton, New Jersey, U.S. A.





*Ninety years' experience in  
making good*

# VARNISH

TRADE **Artisto Finish** MARK

Produces a beautiful, dull, artistic finish over natural wood or stained work. Enriches the grain and coloring of the wood without the defects found from using wax. Will not scratch or mar white and is very durable. Dries hard overnight.

TRADE **Rex White Enamel** MARK  
(Semi-Gloss)

A beautiful white enamel, drying with a rich, eggshell gloss effect. Durable and easy working, covers perfectly and is out of dust within a few hours.

**EDWARD SMITH & CO.**

"Varnish Makers for 90 Years"

Head Office and Works

West Ave., 6th and 7th Sts., Long Island City, N.Y.

P. O. Box 1780, New York City

Western Branch, 3532-34 South Morgan St., Chicago

IN VIEW OF THE PUBLIC'S SUDDEN REALIZATION THAT

*"Signed Lumber is Safe Lumber."*

and their knowledge  
that "TIDEWATER CYPRESS" is  
the distinctively DECAY-RESISTING kind, it's  
NO WONDER "CLIENTS ARE

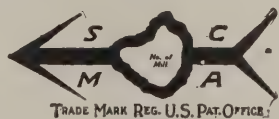
INSISTING ON

**TRADE MARKED**

**CYPRESS**

(The true 'Wood Eternal')"

Accept no  
CYPRESS  
without  
this mark



mechanically indented in the end of *EVERY PIECE*  
(or stamped on every bundle of small items).

Communicate with our "ARCHITECTS' DEPARTMENT." Our entire  
resources are at your service with Reliable Data.

**Southern Cypress Manufacturers'  
Association**

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Building, New Orleans, La.

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INSIST ON TRADEMARKED CYPRESS AT YOUR LOCAL LUM-  
BER DEALER'S. IF HE HASN'T IT, ASK HIM WHY AND  
LET US KNOW. WE WILL SEE THAT YOU GET IT.

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**O'Brien's**

**Liquid Velvet** THE WASHABLE  
FLAT WALL FINISH

Was used in this and many of the country's important  
commercial buildings.

LIQUID VELVET insures light, sanitary offices and a  
decorative effect that is dignified and pleasing to the eye.  
LIQUID VELVET is made in white and 24 colors.

THE O'BRIEN VARNISH COMPANY

49 Washington Street, South Bend, Ind.

"Varnish Makers for half a Century"

**Kyanize**  
KY-AN-IZE

**WHITE ENAMEL**

QUALITY, OF THE KYANIZE SORT,  
IS QUICKLY RECOGNIZED BY LEAD-  
ING ARCHITECTS. THAT'S THE  
REASON **KYANIZE WHITE ENAMEL**  
IS INVARIABLY SPECIFIED WHERE  
THE HIGHEST GRADE WHITE EN-  
AMEL FINISH IS REQUIRED.

We have compiled, for busy architects, a booklet  
of specifications—brief, vital Kyanize facts. A  
postal will bring your copy.

**Boston Varnish  
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EVERETT STATION - BOSTON, U. S. A.

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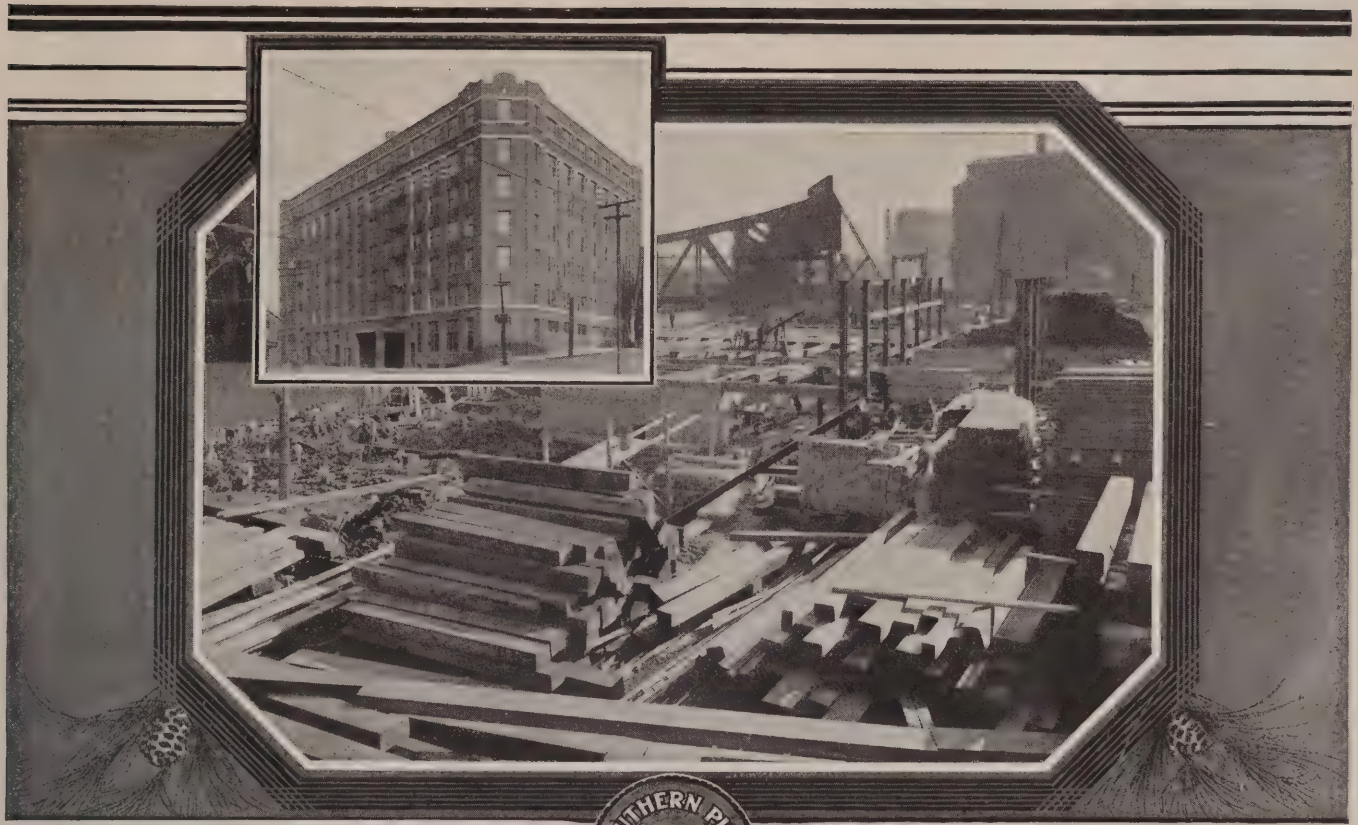
Pure  
White  
Beauty

Pleased  
Owner

Proud  
Architect







*The Thompson & Taylor Spice Company's Plant, Chicago, under construction and completed.*

## Mill Construction—Now!

WARTIME conditions have added two more important reasons to the many that make Modern Mill-Construction the type chosen by experienced builders of industrial plants:

(1)—The timbers and lumber required for Mill-Construction are today by far the most plentiful and most available building material.

(2)—The wartime advance in the price of lumber has been insignificant—almost negligible as compared with the soaring prices of competitive materials.

## Southern Pine

*"The Wood of Service"*

is the standard wood used in Standard Mill-Construction, and dense, durable, dependable, perfectly manufactured Southern Pine may be had in all its forms TODAY. When your Southern Pine comes from a Southern Pine Association mill, its quality is *guaranteed* under the most rigid grading rules ever devised. And it costs far less than any other structural material of anything like the same high quality.

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# Southern Pine Association

NEW ORLEANS, LA.



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Three peculiarities set this wood entirely apart from all other pines. First, its great variety of figure, ranging from plain and straight to the most complex, making possible a choice which exactly reflects the spirit of the room. Second, its freedom from resin, which renders it splendidly susceptible to stains and enamels. Third, its light color, permitting clearer, brighter finishes than can be secured on darker woods.

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Pine*



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Englewood, N. J.  
for Chas. E. Smith, Englewood, N. J.

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of Architecture made possible by the use of the famous 24-inch "DIXIE-WHITE"

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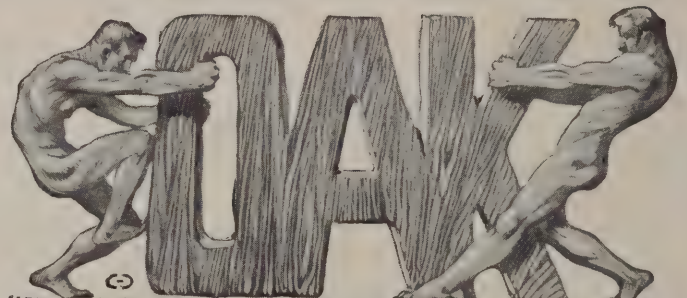
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Built in 1802.  
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The front elevation of this house was shown in Vol. 1, No. 2 of the White Pine Monographs.

THREE essentials for success in home-building are—a practical plan, artistic design and good workmanship.

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Nature's Light Diffusion

### And How it is Reproduced by Science

THERE are two kinds of reflection, — *Specular*, which is direct reflecting in detail, and *Diffused*, which reflects in all directions without displaying visible objects. Specular reflecting surfaces, under direct light, produce strong contrasts and glare most trying to the eyes. Diffused reflecting surfaces eliminate the possibility of such conditions.

From this it is evident that walls, ceilings, fixtures, and all other areas visible to the eye, should present only surfaces that provide *diffused* reflection, and that direct light, either natural or artificial, should be concealed from actual vision and diverted to these surfaces through fixtures or attachments that will diffuse light with the smallest percentage of loss.

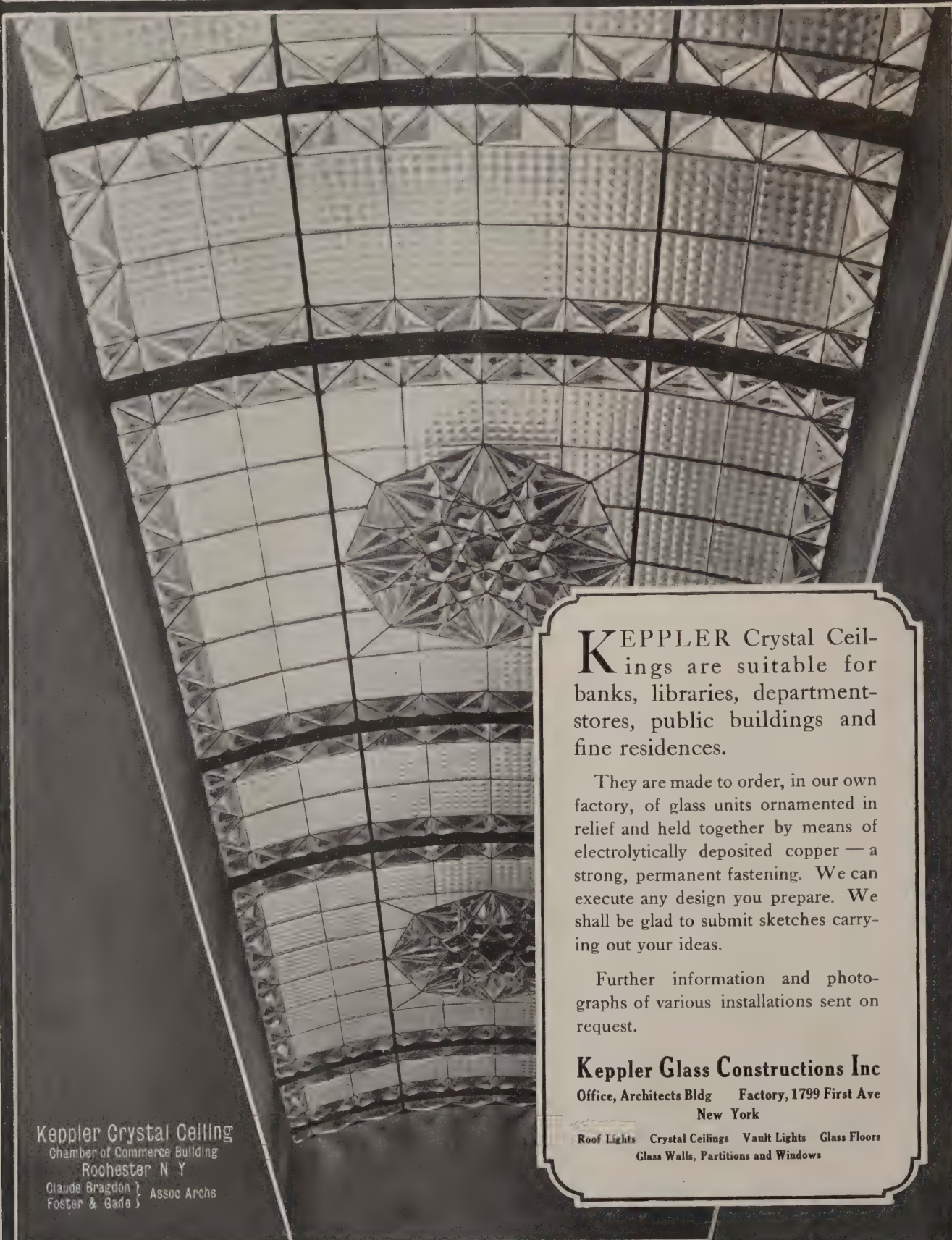
Wilson Diffuselite Blinds fully meet the requirements: they divert the direct rays of the sun and strong daylight at the window openings to the ceiling in such a manner that all light falls evenly from above throughout the entire room, eliminating strong contrasts and glare. In addition they furnish an increased percentage of light, due to the reclamation of sun rays which under other conditions would be lost at the window opening.

THE J. G. WILSON CORPORATION  
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For further information and interesting data relative to this subject, send for Leaflet No. 5 in the series — *Illuminating and Ventilating of Modern Buildings*



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They are made to order, in our own factory, of glass units ornamented in relief and held together by means of electrolytically deposited copper — a strong, permanent fastening. We can execute any design you prepare. We shall be glad to submit sketches carrying out your ideas.

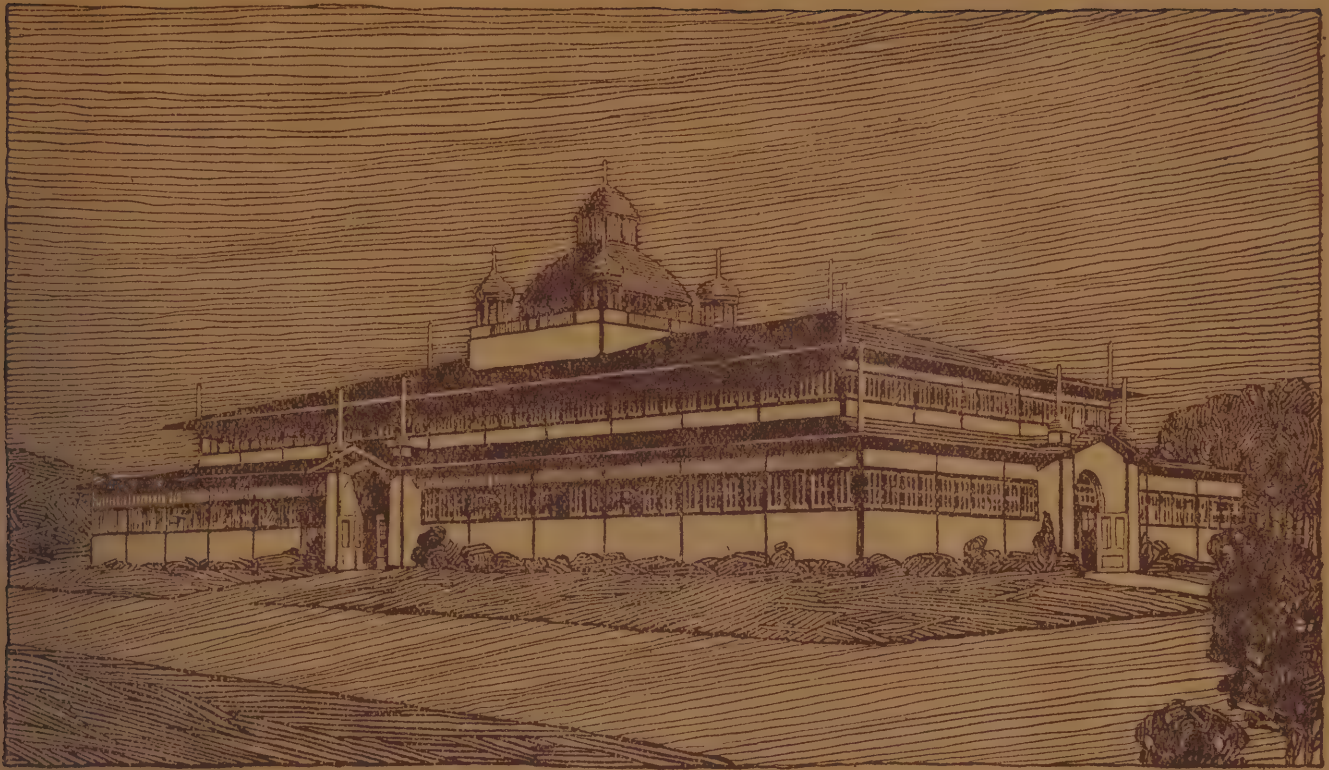
Further information and photographs of various installations sent on request.

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Exposition Building, Erie, Pa.

Stucco Finish on Bishopric Board

Architect, Jos. Lee, Erie, Pa.

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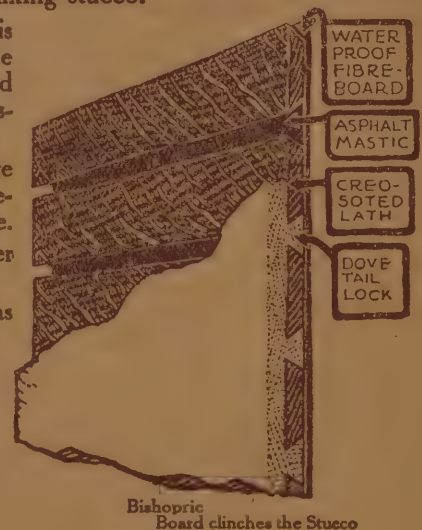
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